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NOTES ON THE SOURCES OF THE PEACE RIVER, BRITISH COLUMBIA

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(Map facing p. 24)

On the official government maps of British Columbia there are considerable areas of blank white paper surrounding the head waters of the Mackenzie River. The principal tributaries of the Mackenzie from the west, namely the Liard, the Peace and the Athabaska Rivers have their source in a rugged pile of mountains which constitute the northern end of the backbone of the Rockies. Of these three tributaries, the Peace River is particularly interesting, because it performs the noteworthy feat of rising on the western side of the mountains in a great trough-like valley, whence it makes its escape by cutting a deep gorge clean across the range, through which it flows eastward to the great plateau.

This extraordinary work of nature was discovered and described by Alexander Mackenzie on his historic journey across the continent to the Pacific, in 1792-3[1]. Selwyn followed in 1875[2]; and Dawson in 1879 mapped the valleys of the Parsnip and Peace Rivers[3]. On Dawson's map appears the notation "rugged mountains tipped with snow in August"; and he made a reconnaissance into the more accessible portion of the range, traversing the Pine River Pass, south of the Peace River.

In later years McConnell[4] and Robertson[5], Canadian geologists,

1 Alexander Mackenzie: "Voyages ——." London, 1801.

2 Alfred R. C. Selwyn: Report on Explorations in British Columbia, *Report of Progress, Geol. Surv. of Canada, 1875-6.*

3 George M. Dawson: Report on an Exploration from Port Simpson on the Pacific Coast to Edmonton on the Saskatchewan, Embracing a Portion of the Northern Part of British Columbia and the Peace River Country, *Report of Progress, Geol. Surv. of Canada, 1879-80.*

4 R. G. McConnell: Report on an Exploration of the Finlay and Omineca Rivers, *Annual Report, Geol. Surv. of Canada, Vol. VII, 1894.*

5 Wm. Fleet Robertson: Essington to Edmonton, *Report of Minister of Mines of British Columbia, 1906*, pp. 101-131.

have explored the Peace River and its principal tributaries, making geological studies of the valleys and adjacent mountain slopes; but little has been done in the mountains. The range is so rugged that travel is difficult, and, because of the remoteness of the region, a summer season is all too short for a serious exploration. E. A. Preble of the U. S. Biological Survey traveled overland from Telegraph Creek to Fort Grahame in 1910, with the intention of crossing Laurier Pass, but was forced by the lateness of the season to give up that part of the trip and descend the Finlay and Peace Rivers.

In 1912 the new transcontinental railroad reached the head of

FIG. 1—The eastern approach to Yellowhead Pass follows a gradual slope in the valley of the Athabaska and Miette.

navigation on the Fraser River, which approaches the southern source of the Peace River, thus opening an easier approach by water. Grasping this opportunity, I undertook, with Mr. W. F. Patterson of New York, to study that part of the range which lies north of the Peace River, in the vicinity of Laurier Pass. The objects of the trip were mainly biological. This region was chosen particularly in the hope of throwing light on the problem of the mountain sheep and of determining, if possible, whether the northern "black sheep" (*Ovis Stonei*) is consistently distinct from its more southern neighbor, the "bighorn" (*Ovis Canadensis*), or whether the two species intergrade.

With a commission from the U. S. Biological Survey to collect specimens for the National Museum and a permit kindly furnished by the Provincial Museum of British Columbia authorizing this

work, our hands were more than full; hence the opportunities for geographical work were limited. We did, however, take such simple observations as were necessary to plot our route with a fair degree of approximation and to locate the principal mountain peaks by cross bearings (see footnotes 8 and 9). The results are shown on the attached map.[6]

Itinerary. The route chosen to reach these mountains was as follows: Leaving Edmonton, Alberta, we proceeded westward by

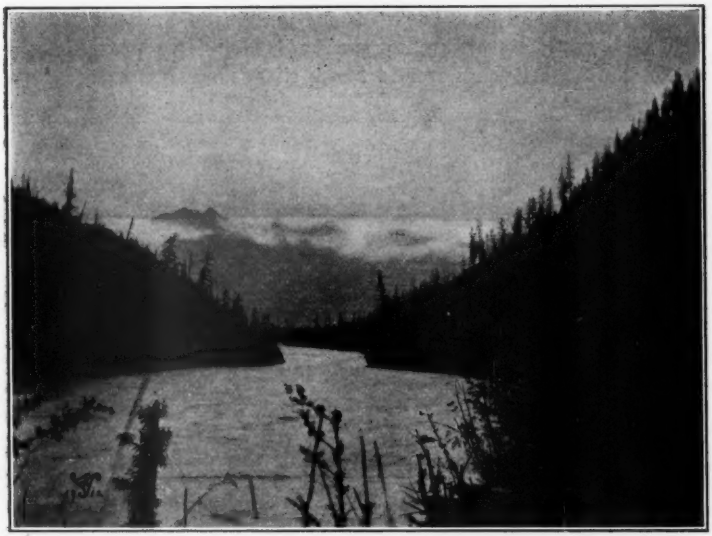

FIG. 2—The Fraser River 47 miles from the summit of Yellowhead Pass, just before it emerges from the steep water-cut valley into the great preglacial trough, which is seen in the distance. Looking west.

the new Grand Trunk Pacific Railroad[7] as far as the end of the steel, twenty-eight miles beyond Yellowhead Pass. From Mile 28 on the railroad our outfit was hauled twenty miles by wagon down

[6] Besides the author's observations the following sources were used in the compilation of the map:

Dawson: Map of Northern British Columbia and the Peace River Country, 1:506,880. Sheet II. *Rept. Geol. Surv. Canada, 1879–80.*

McConnell: Map of Finlay and Omineca Rivers, B.C., 1:506,880. *ibid.*, N. S., Vol. VII, 1894.

Lafferty and Tobin: Map Showing Route from Edmonton to Yukon River as followed by a Party of North-West Mounted Police under command of Insp. J. D. Moodie. 1:675,840. *Rept. North-West Mounted Police, 1898.*

Map of Peace River Block, 1:506,880. Accompanies "Description of Surveyed Townships in the Peace River District." Topogr. Surveys Branch, Ottawa, 1913.

Pre-Emptor's Map: Peace River Sheet, 1:253,330. B. C. Dept. of Lands, 1913.

[7] We are indebted to the officials of this railroad for carrying our canoe and outfit on a construction train, and for marked courtesies and material assistance at the start of the journey.

the west side of the pass to Mile 48, five miles above Tête Jaune Cache. There the canoe was launched, July 13th, 1912, and we proceeded down the Fraser River to the point where it turns south, above Fort George. Here the Giscome Portage brought us to Summit Lake, the southernmost source of the Peace River. Then we followed the Crooked, Pack and Parsnip Rivers northward to the junction of the Parsnip and Finlay, forming the Peace River, which was followed through the gorge above mentioned to the Mountain-of-Rocks Portage above Hudson's Hope. Here we secured horses and pack outfit for the journey in the mountains to the northwest. Returning to Hudson's Hope, we proceeded by canoe down the Peace River to Peace River Crossing, thence over-

FIG. 3—A break in the southwest wall of the trough, showing high mountains near the source of Castle Creek.

land to Lesser Slave Lake, then down the Slave and Athabaska Rivers to Athabaska Landing, which point had just been reached by a new railroad. The entire circuit from railroad to railroad is approximately fourteen hundred miles, and the trip occupied three months' time.

The Fraser River. A noteworthy feature of the Rocky Mountain region in British Columbia is the broad trough which follows the mountain range, and in which flows a succession of rivers, some northwesterly and some southeasterly. This trough was evidently the bed of a great river in preglacial times, but the subsequent accumulations of morainic material have divided it into half a dozen different watersheds. South of the Yellowhead Pass the trough is occupied by the Canoe River, flowing southeast into the Columbia

River, which it meets, coming in the opposite direction, at the Big Bend. North of Yellowhead Pass it is occupied by a small tributary of the Fraser, and finally by the Fraser River itself, flowing north-west. The principal source of the Fraser, however, rises near the summit of the pass and plunges through a narrow water-cut valley, passing near the base of Mt. Robson, the highest known peak in Canada (13,700 feet), and finally flowing out into the pre-glacial trough at Tête Jaune Cache (Fig. 2).

The descent from Yellowhead Pass to the great trough is steep and rugged, in marked contrast with the gradual approach to the pass from the east by a broad, open valley (Fig. 1). From Mile

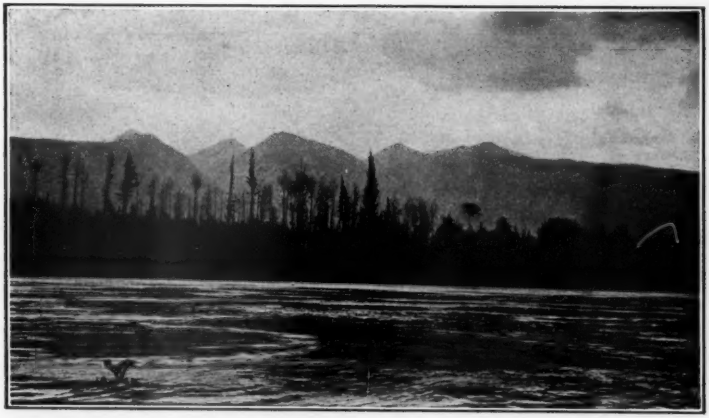

FIG. 4—The Fraser River below Castle Creek looking southwest across the level bottom of the great trough to the wall of the mountains. The foreground is recently burned.

28, below Moose Lake, to Mile 48, five miles above Tête Jaune Cache, the river drops about one thousand feet, through a series of rapids and cataracts which make canoe travel impracticable. Below Mile 48, the river is navigable for canoes, and, although turbulent and full of whirlpools, there is nothing of serious moment until the Goat Rapids are reached, below the mouth of Goat Creek. These may be run in safety at ordinary stages of the water. The next obstacle is at the "Grand Canyon." This is in two parts. The upper canyon proved impracticable for a heavily loaded canoe and was portaged, but the lower canyon was run without mishap, though a whirlpool forming unexpectedly caused some excitement.

Between Tête Jaune Cache and the Grand Canyon the river

follows a very tortuous course through the alluvial bottom of the great trough. The bottom is from three to five miles wide and is flanked by fairly high mountains, with rugged snow peaks visible through the gaps (Figs. 3 and 4). Through this bottom the river swings from side to side of the trough, cutting in places steep banks, sometimes fifty to one hundred feet or more high, of stratified rock-powder flaked with mica, in which thousands of bank swallows make their nests. The eroded material fills the river with a gray, glistening silt, and forms ever-shifting bars over which the river whirls and boils like a seething cauldron. As the river flows north and westward, the mountains become lower and recede until finally, at the canyon, they cease entirely on the southwest bank and continue

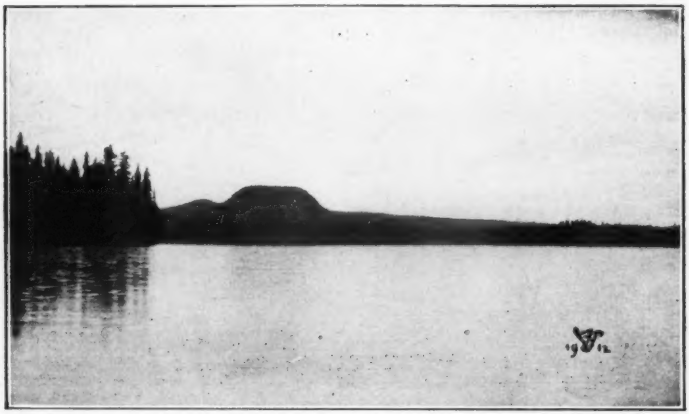

FIG. 5—Summit Lake looking northwest. The little knob (locally known as Teakettle Mountain), which marks the beginning of the Crooked River, is the only break visible on the surface of the interior plateau.

only a little farther on the northeast shore. At the canyon the alluvial bottom of the trough gives place to a rock ledge through which the river has cut a narrow gorge, finally emerging into a great area of wooded hills and bottom lands, which continue beyond the point where we left the river, at Giscome Portage. Here the river makes a great bend to the south and plunges into a series of rapids which obstruct navigation above Fort George.

The valley of the upper Fraser River is forested throughout. Great havoc, however, has been wrought by the railroad construction crews, who start fires to clear the right-of-way and allow them to spread over the whole mountain side. As far as the active work

has proceeded, these burnings are not the exception, but the rule, and the destruction of fine forest is appalling. I understand the fault lies mainly with the contractors, and that steps have been taken to check their depredations. This is highly desirable since the Fraser valley contains much very fine timber, and its burning means not only great pecuniary loss, but the ruining of a scenic route whose value would be immeasurably greater if it were not marred by blackened skeletons of trees.

Above Tête Jaune Cache and on the mountain sides the forests are mainly of spruce and lodgepole pine. In the river bottom there is a fine mixed forest (where not burned) of birches (*Betula papyrifera*), large cottonwoods (*Populus balsamifera*), aspens,

FIG. 6—The Crooked River winds and twists between boggy shores bordered by willows and alders.

spruces, some Douglas fir, balsam fir and cedar; alders growing to trees six and eight inches in diameter, and various willows. At the canyon we measured a cottonwood tree having a circumference of seventeen feet, breast high, and a spruce ten feet; at Goat Rapids a cedar sixteen feet, breast high. Below the Grand Canyon, as the mountains fall away, more aspens and birches appear, but there is also a good deal of fine spruce timber. Undergrowth, including the spiney "devil's club" (*Fatsia horrida*) is usually so dense as to discourage travel on foot.

The Crooked, Pack and Parsnip Rivers. At Giscome a seven mile portage leads over a ridge to Summit Lake, the source of the

Crooked River. This ridge, although only four hundred feet above the river, is nevertheless the divide between the Pacific watershed of the Fraser and the Arctic waters feeding the Peace River; and it marks a change in the aspect of the country quite incommensurate with its size.

Summit Lake (Fig. 5) is a placid body of clear, limpid water, in the midst of a broad plateau which extends as far as the eye can reach. The shores are flanked with dark spruces, and there is no landmark to break the severely level skyline but a little knob known as Teakettle Mountain, apparently of igneous rock, which guards the outlet of the lake and marks the beginning of the Crooked River.

The Crooked River (Fig. 6) is a little meandering stream which well earns its name as it wriggles on its erratic way; sometimes calm and placid, again plunging suddenly into a miniature rapid or spreading out over a gravel bed. At first the shores are boggy and bordered by willows and alders. The mountains are far away, and the occasional hills that break the monotony of the landscape are of gravel, or glacial detritus. As the hills grow higher they are covered with a fine coniferous growth—spruce, balsam fir and a few Douglas fir. In places there are gravel banks grown with lodgepole pines, many of which are conspicuously marked with scars made by the Indians, who strip the bark for the purpose of collecting sap for food in the spring.

At McLeod Lake a spruce-clad ridge appears on the east shore, and on the flat land below the lake the first cottonwoods observed on the Arctic watershed were found. These cottonwoods are of great importance to the few Sikanni Indians who inhabit the region, since they furnish the material for dugout canoes, which the Indians fashion with great skill. Some of these canoes are thirty to forty feet long and are remarkably light, considering the crude method of their construction. With their long, narrow form they are admirably adapted to poling upstream against the swift current of the rivers. Near the confluence of the Pack and Parsnip Rivers, the cottonwoods largely replace the spruce, growing on banks of gravel and sand in which streaks of lignite appear (Fig. 7).

The Parsnip River is much larger than the Pack (as the outlet of McLeod Lake is called) and the brown bog waters of the latter are soon engulfed in the stronger stream, whose green color indicates its origin in the snow mountains. Here, for the first time, high mountains become visible to the north and east.

This confluence is noteworthy from the fact that when Alexander Mackenzie reached this point, going up stream, he chose the east fork, or Parsnip River, instead of the west, or Pack River, which we followed. He was thus led into a rugged tangle of mountains and suffered much hardship which might have been avoided if he had happened to choose the lower and easier route.

Below this point, the Parsnip River is a strong, full stream, flowing with a swift, but a fairly uniform current through a rolling country. With its northward progress it approaches nearer to the eastern range of mountains, of which we caught occasional glimpses through the fog and low-hanging clouds which hung over the valley for several days.

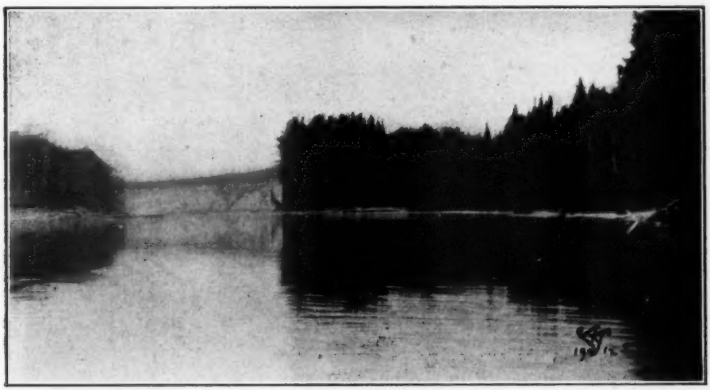

FIG. 7—Near the junction of the Pack and Parsnip Rivers, showing typical cottonwood growth on a gravel bar, and a cut bank beyond.

Three miles above the mouth of the Nation River, the first rock becomes visible in a limestone exposure, which has been sharply cut off by the river; and here we jumped into a series of vigorous rapids—not rough enough to be alarming, but very acceptable after the long stretches of shoal water obstructed by gravel bars, through which we had passed.

The river then pursues a somewhat meandering course, cutting its way frequently between steep banks which suggest those of the Fraser River, although here they are of coarse sand and gravel. The eroded material has been deposited in the river bed, forming numerous islands, some of them a mile or two long, which frequently divide the stream into several branches. These islands are continu-

ally shifting. In some places, no less than four distinct growths of cottonwoods of various ages mark the water lines of successive flood seasons. The river bed evidently has changed materially since Dawson's exploration, the main channel sometimes passing around an island where he shows only a narrow by-pass or even a peninsula, so that it is difficult to recognize the landmarks noted on his map. Consequently, we were quite taken by surprise when we met, almost head on, the strong current of the Finlay River, flowing down from the northwest through a broad valley flanked on both sides by mountains.

The two streams mingle in a boiling, tumbling rapid half a mile below their confluence, and even at this distance the roar of waters

FIG. 8—Mt. Selwyn from the Peace River below Finlay Rapids, looking S. 41° E. The river swings to the right, passing close to the precipitous north face of the mountains.

gives ample warning of trouble ahead. Thus the Peace River is formed.

Mt. Selwyn and the Upper Peace River. The body of the river flows to the south of an island in a smother of great swells. Close to the south bank, however, one may pick a channel by which a canoe can be let down in safety. In a light canoe this channel might have been run with care, but with our heavy load we considered it wiser to line the canoe down, especially as the river broadens out below the rapid in a huge eddy which might easily cause trouble. At high water this is doubtless a dangerous whirlpool.

Below the rapids the river sweeps on with a steady, majestic flow,

bearing us swiftly toward the gap in the mountains, which is guarded by Mt. Selwyn—a fine peak rising abruptly from the south bank of the river. A clear, cold stream drains the western slope of the mountain and at its mouth we beached our canoe and cached our outfit, well out of reach of inquisitive bears and porcupines, taking on our backs light packs with four days' provisions for a reconnaissance of Mt. Selwyn and its neighboring peaks.

Mt. Selwyn (Fig. 8) is the apex of a rugged escarpment running approximately northwest and southeast, very precipitous on the northeast side, where it drops off into a valley separating it from

FIG. 9—The Parle Pas Rapids, Peace River, showing the wooded bottom land and rounded hills on the south bank.

a broader chain of mountains farther east. On the southwest side the slope is more gradual and is cut into numerous glacial basins, feeding the stream before mentioned. There are three main peaks, the one next the river being the lowest and the third the highest—approximately 7,500 feet.

Climbing is rendered difficult by a tangle of down timber, resulting from a fire which swept the whole mountain side, apparently twenty years or more ago. This tangle is growing up with aspens

and lodgepole pines to an altitude of 4,500 feet, although the remains of the former spruce growth continue up to 5,200 feet.[8]

We intended to camp about tree-line, but we found that the snow on the southwest slope was all melted and the mass of quartz rock, of which the mountain is largely composed, afforded no water. Hence we were forced to descend to the western valley for the night. The next day, however, we found a glacial basin a mile or so farther south, containing a pure emerald pool at 5,200 feet where we made our camp while on the mountain. At this altitude there was just enough scrub for a meager fire.

We had hoped to find traces of mountain sheep in these mountains and perhaps secure specimens by which we could determine

FIG. 10—Fording the southwest branch of the Halfway River. The northwest branch flows behind the ridge seen in the distance.

what species is found south of the Peace River, but in this we were disappointed. We were well repaid, however, by the outlook obtained over the valleys of the Peace and Finlay Rivers, and the range of mountains to the northward toward which we were journeying.

[8] All altitudes were determined by aneroid, using as data Dawson's records of 2,000 feet for the Peace River at Mt. Selwyn and 1,522 feet at Hudson's Hope. Continuous travel made it impossible to take simultaneous readings at a datum point, but corrections for barometric variation were made as accurately as possible by comparison of night and morning readings. No hypsometer readings were taken, but the two aneroids used were in good agreement. One of them was calibrated by the U. S. Bureau of Standards on our return and the observations corrected accordingly.

In the dim distance, bearing N. 19° W.[9] we could distinguish a great peak, which dominates everything in this direction. This peak appeared to lie in the vicinity of Laurier Pass, our objective point, so I took its bearing with considerable care and sketched its profile in the hope of identifying it later. Because of its three-toothed outline, we called it Trident Peak for purposes of identification; and this striking contour enabled us to locate it later.

Returning to the canoe we were carried, almost without effort, by the strong, swift current, through a mighty gorge flanked by mountain peaks which swept by like an ever-changing panorama; rising on the south shore precipitously, on the north shore with softer and more rounded outlines—a wonderfully impressive scene that beggars description.

FIG. 11—The approach to Laurier Pass through the valley of Cypress Creek—about 4,500 feet. Timber-line is visible on the mountains about 500 feet higher.

The first day's run carried us beyond the mountains and through the Parle Pas Rapids—the second serious obstruction to the Peace River, which is formed by a ledge over which the river plunges, extending almost across the river bed (Fig. 9). On the north shore this ledge is broken, thus affording a channel through which a canoe may be taken with care.

Below the rapids the river traverses an area of foot hills, which

[9] All bearings are referred to the true meridian as determined in the valley of the Halfway River by an observation of Polaris, duly corrected for azimuth. The compass variation thus found, 39° E., has been used to reduce the compass bearings. The compass, with folding sights, was read to the nearest degree on a 2½ inch circle.

are steep and practically devoid of timber on the north side. For the most part they are covered with a short herbaceous growth in which a species of *Artemisia* is conspicuous, although there are some bold headlands of sedimentary rock with almost horizontal strata. Frequent exposures of coal or lignite are seen.

The south shore, however, is conspicuously different. The hills are rounded and spruce-grown, and are often separated from the river by a mile or two of bottom land.

The second day brought us to the Mountain-of-Rocks Canyon—a narrow gorge cut by the river around the flank of a rock knob that obstructed its course. This canyon forms a horse-shoe about twenty-five miles long in which the river drops 275 feet, being entirely impassable. A portage fourteen miles long connects the horns of the horse-shoe, with the old Hudson's Bay post of Hudson's Hope at its lower end. Here we obtained horses and pack outfit for the journey to the mountains. With two packers our party was now increased to four.[10]

The Halfway River, Laurier Pass and the Mountains. From Hudson's Hope our course lay northward, crossing the 1,640 foot wooded terrace which flanks the river and climbing 600 feet higher, to an open plateau sloping gradually upward to the north. For twenty-five miles our route led over this rolling slope, sparsely grown with aspens and lodgepole pines, with copses of willow and alder and some patches of spruce, until a height of land was reached at 2,800 feet altitude. Beyond this divide the country slopes to the valley of the Halfway River, whose southwest branch was crossed a few miles above its confluence with the northwest branch (Fig. 10).

We were surprised to note that this southwest branch, which appears through a gap in the mountains to the westward, carried by far the larger part of the water. On the published maps this appears as a minor tributary, the northwest branch apparently being the more important. The significance of this observation will appear later.

Our course now followed the northwest branch of the Halfway to the mouth of Cypress Creek, which led us westward to its source in the mountains (Fig. 11). The northwest branch continues, apparently, parallel to the range.

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[10] At this juncture the courteous aid of the Revillon Frères Trading Company saved us serious delay, for the Beaver Indians of Hudson's Hope were all away on the hunting trail and the trading posts were closed for the summer.

On the Halfway River we struck and followed for some miles a trail which was located by Inspector Moodie of the Northwest Mounted Police in 1897, in the effort to discover an overland route to the Klondike by way of the Pelly River[11]. Inspector Moodie, true to the traditions of the service, succeeded in reaching his goal after more than a year of hard and adventurous work, but the route was never a popular one. We found a few fragments of broken sledges and discarded cook-stoves as mute evidence of the failure of those treasure seekers who attempted to follow his lead, all of whom were forced to retreat or met a worse fate in the mountains. We found no indication of the trail having been used recently.

Following Cypress Creek, we passed through a notch between the hills into a rounded valley grown with willows and scrub birches (*Betula subulata*) and flanked by spruces and lodgepole pines. Thus we were led toward a conspicuous snow-flanked peak bearing S. 69° W. which marks the eastern summit of Laurier Pass. Like the eastern approach to Yellowhead Pass, the slope of this valley is so gradual that we would hardly have realized the altitude we were making without our aneroids. At the summit of the pass (5,300 feet) we made camp No. 34 in the last of the spruce scrub, which in all this region ceases quite abruptly at about 5,500 feet. Below this the first well-formed trees are found at about 5,000 feet, and from that point down to 4,000 feet they are stunted by the rigor of the climate, old trees with a diameter of 12 to 18 inches rarely exceeding 30 to 40 feet in height.

On the south side of Laurier Pass the snow peak above mentioned rises abruptly to about 7,000 feet. This is the highest peak visible on the eastern side of the range, and from it we obtained a fine view of the mountains to the north and westward. Because of its commanding location and convenient proximity to a roughly established base line in the valley, it was chosen as a principal observation point and called for identification, Laurier Peak.

The mountains are divided into two ranges by a valley perhaps twenty-five miles wide, containing two principal forks and several tributaries of a stream flowing to the south. The eastern range is composed largely of limestone and shale, in which springs are abundant even near the summits, being thus in marked contrast with the dry quartz rock of Mt. Selwyn. The mountains are, for the most part, rounded and not so high as those to the west. The

[11] J. D. Moodie: Edmonton to the Yukon. *Report of the North-West Mounted Police, 1898*, Part II, pp. 3–82.

western range is a rugged chain of serrated peaks, extending approximately N. 17° W. as far as the eye can reach. Among them, though partly hidden at this point by nearer mountains, is a sharp cone which was afterward identified as the Trident Peak, seen from Mt. Selwyn. Farther north are several conspicuous snow peaks. One of them bearing N. 24° W. is especially prominent because of its sharp outline and precipitous front, which, notwithstanding the fact that it towers above neighboring snow peaks, was entirely bare of snow in August, except for a round spot near the summit. This spot, like a single glistening eye, suggests the name Cyclops for this mountain. Its distance from Laurier Peak, as determined by cross bearings, is approximately 50 miles.

Still farther north and bearing N. 20° W. is another mighty peak, completely shrouded in perpetual snow. Beyond this the mountains stretch as far as the eye can reach, the last one visible bearing N. 17° W. This bearing represents approximately the trend of the rugged sierra which constitutes the main crest of the range.

Northeast of Trident Peak and east of the main sierra is another mountain bearing N. 53° W. from Laurier Peak, which, although not so high as the main range, is conspicuous because of a fair sized glacier on its eastern front. We approached later close to the base of this mountain, which marks the northern limit of our journey.

The descent from the first summit of Laurier Pass to the median valley is rapid. We dropped 1,000 feet in three and one-half miles, and 250 feet more brought us to the bottom of the valley, 9 miles above the main fork of the stream. We crossed the valley and made camp No. 35 on the western branch of the stream, which rises in an emerald green lake near the base of a sharp cone, which, because of its comparative isolation, is a conspicuous land mark.

From this camp we made a reconnaissance of a huge crescent-shaped basin guarded by rugged limestone peaks, estimated as 7,500 feet high, which culminate on the west in Trident Peak, whose altitude is not far from 8,000 feet (Fig. 12). Then we worked northward up the northwest branch of the stream to its source near the base of the glacier peak, later crossing a 6,500-foot saddle to the northeast branch (Fig. 13).

From one of the intervening mountains we obtained a view of Trident Peak, which exhibited the precise profile (though reversed and bearing S. 5° E.) that I had sketched from Mt. Selwyn, thus completing the identification.

We hoped to be able to press farther northward through the

median valley, but a succession of snow storms, beginning August 24th, seriously hampered us in our work among the peaks so that the available time was practically all expended in making the necessary biological collections. We were, therefore, compelled reluctantly to turn back.

We were informed later by a band of Indians that this valley could not be followed much farther. They said it was possible to travel in the winter with dogs, but it was a "bad place for horses."

We decided to return by a different route, following the stream

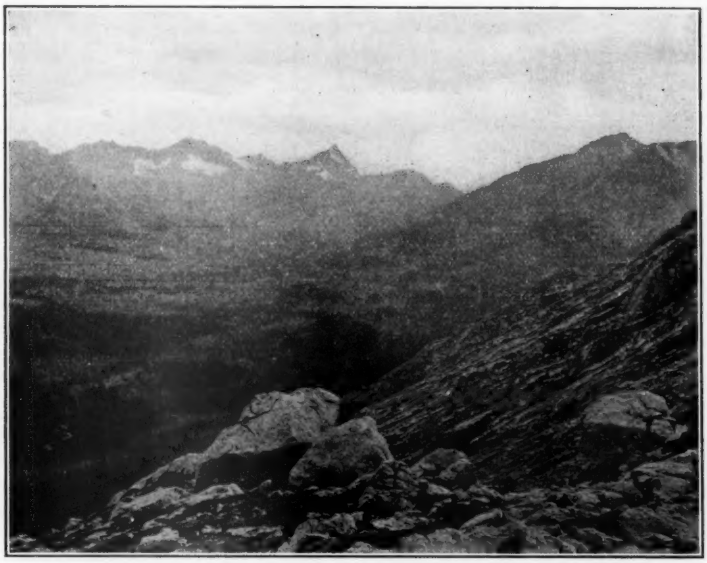


FIG. 12—Trident Peak (the sharp peak in the center) from a limestone mountain 6,300 feet high south of camp No. 35—looking S. 43° W. The two lateral shoulders are not visible from this angle.

in the median valley, if possible, to the Peace River. This stream appears on the map as the source of the Ottertail River, which enters the Peace River below the Parle Pas Rapids.

For twenty miles we proceeded without serious difficulty, traveling alternate days and using the intervening days to cut trail, but soon we became entangled in a mass of down timber which stretched in all directions as far as the eye could reach, so that five miles was a good day's travel. To add to our discomforture, the river swung

away from its southerly course and turned eastward, away from the mountains.

At this juncture, we had the good fortune to fall in with a band of Beaver Indians, returning from a hunt on the Nelson River. They frowned unpleasantly at the sight of our sheep and caribou heads, which they said were their sheep and their caribou. They were mollified, however, by gifts of tea and tobacco, and became quite communicative. They were amused by the white man's notion that the Peace River could be reached that way. To the south, they said, there was only a tangle of mountains and the stream we were following did not flow into the Ottertail, but made a big bend to the southeast, emptying into the Halfway River. The Ottertail had its source on the other side of Trident Peak.

FIG. 13—Crossing the divide (6,500 feet) between camps 36 and 37, looking west toward the main range. The highest peaks of the western sierra are hidden by nearer mountains.

Thus was explained the puzzle of where the southwest fork of the Halfway River gets its water. Viewed from below no adequate water-shed is disclosed beyond the notch, almost blocked by mountains, from which the stream issues; but by flowing around this barrier range, as the Indians said, and draining the interior basin, it obtains a water-shed quite sufficient to explain its large size.

The Indians had just cut a new trail into the valley where we met them, and we were thus enabled to cross the eastern range by a 4,800 foot pass and descend into the valley of Stone Creek (as the Indians called it in their own language) which led us easily to the Halfway River, and thus to Hudson's Hope.

Stone Creek heads in a valley not far from Laurier Peak, and apparently affords an easier route to the pass than the one we had followed along Cypress Creek. An old Indian trail follows this valley.

Peace River Valley below the Mountains. At Hudson's Hope horses and packers were left behind and we proceeded down the Peace River by canoe. Below this point the river is broad and placid, flowing with a fairly uniform current of five miles per hour, without obstruction and without serious rapids. It cuts its way through the plateau without much meandering, flowing between banks from 500 to 800 feet high, which completely conceal the surrounding country (Fig. 14).

In some places there are strips of bottom land a mile or so wide.

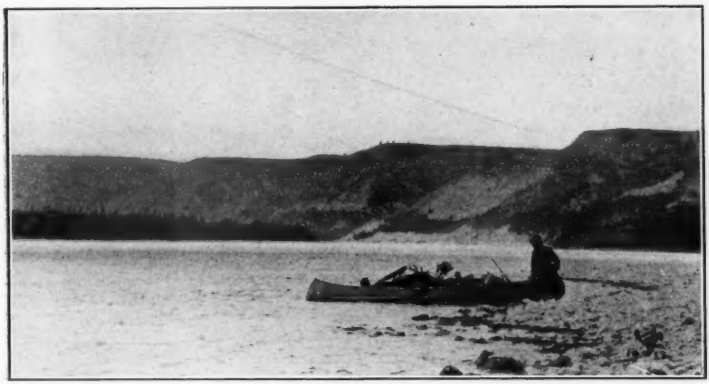


FIG. 14—A typical view of the Peace River, between Hudson's Hope and Fort St. John, showing the steep cut banks. The plateau level is about 800 feet above the river.

Two of these are occupied by the Hudson's Bay and Revillon stores at Fort St. John (Fig. 15) and Dunvegan, respectively. Both places are receiving the attention of boomers. One of the dealers in Edmonton had in his window a large relief map in many colors, illustrating Dunvegan as a fully equipped town, with several railroads, two or three bridges, electric light plants, etc. (Fig. 16); consequently, we expected to find here a thriving community. Imagine our surprise at seeing only the traditional flag pole surrounded by a few log houses of the Hudson's Bay and Revillon Companies, with a little group of Indian teepees (Fig. 17). We were informed, however, that some settlers had taken up land on

the plateau above. They had just suffered the loss of their hay through a terrific forest fire, through which we had been passing and continued to pass for three days.

These fires are the curse of the country. This one appeared to start in three different places simultaneously and is supposed to have been set by the Indians for the purpose of driving the game. At least a hundred miles of the plateau was swept clean, and the smoke of the conflagration followed us all the way to Lesser Slave Lake.

Dunvegan is typical of the numerous towns on paper that are springing up all over the country. The surveying of a townsite in the wilderness, under the peculiar land laws, is the signal for specu-

FIG. 15—Fort St. John on the Peace River, looking north, showing a break in the river bank.

lators to reap a profit from a confiding public. Some of these townsites will doubtlessly pay good returns, but in this region, as in other boom districts, such ventures are naturally highly speculative.

At Peace River Crossing we abandoned our canoe and proceeded overland to Lesser Slave Lake, where we took the Hudson's Bay Company's boat on its last trip out.

The plateau which we traversed is 1,000 feet above the Peace River. It is grown mainly with aspens and much of it has been burned. It appears to be fertile, although at this time of the year (late September) it was very dry and the only water available for camp use was found in a few stagnant, muddy pools, except where we crossed the streams flowing into Lesser Slave Lake. These

streams, however, were flowing freely, and near one of them we found a settler with a fine crop of oats.

Lesser Slave Lake occupies the center of a great alluvial bottom, which supports a most luxuriant growth of wild hay ("blue joint") standing sometimes almost as high as one's head (Fig. 18). We were informed that in the Grande Prairie region, west of the lake,

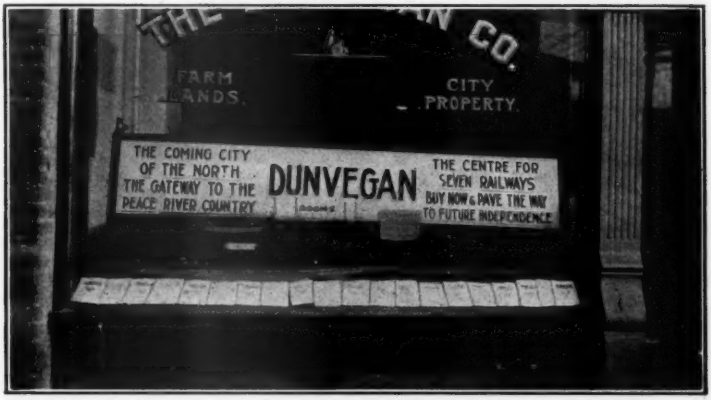


FIG. 16—Dunvegan—as seen from Edmonton.

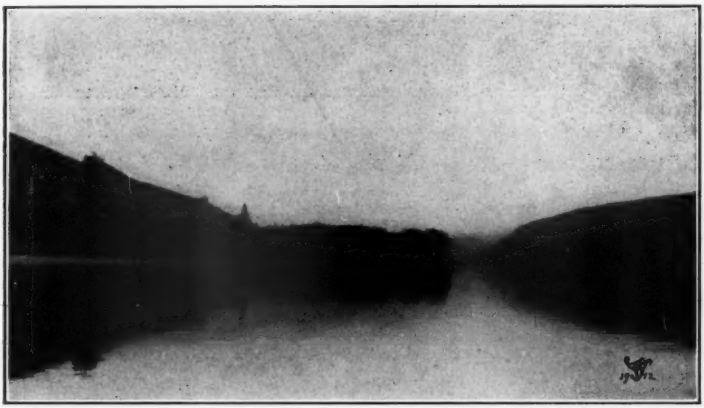


FIG. 17—Dunvegan—as seen from the Peace River.

numerous settlers were carrying on very successful agricultural work.

Economic Development. In the valley of the upper Fraser River, the development at present (1912) consists mainly in the building of the railroad. The steel is laid as far as Tête Jaune Cache, and the work of constructing the roadbed is in progress for a hundred miles or so farther.

Some settlement is taking place farther down the river, from Fort George up through the interior plateau, but not extending to the point where the mountains begin, just below the canyon. This

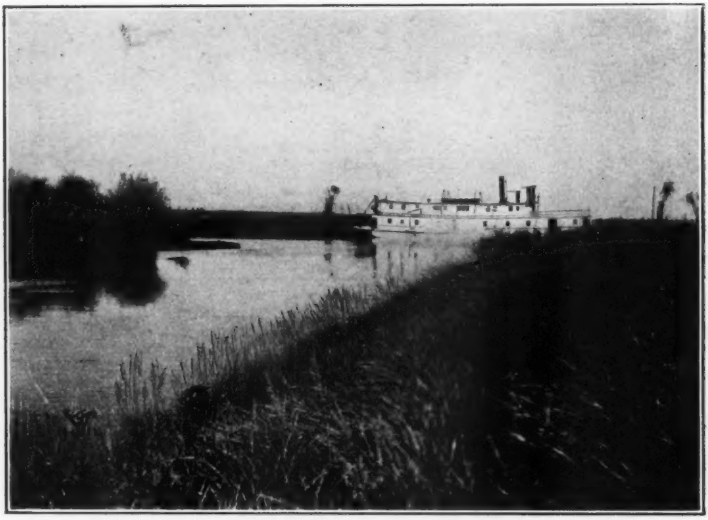


FIG. 18—The Slave River, below Lesser Slave Lake, meanders through a great alluvial basin which supports a luxuriant growth of wild hay. The many turns make navigation difficult.

settlement is being done mainly by squatters, who build a cabin and clear a little land, in anticipation of increasing values when the railroad is finished. This land appears to possess agricultural possibilities, though the mosquito pest is a severe handicap.

In the valley of the Crooked, Pack and Parsnip Rivers and in the Peace River valley as far as the canyon above Hudson's Hope, absolutely no sign of development was found, and no habitations were passed, except at the Hudson's Bay Post at Fort McLeod, where there is a little group of Sikanni Indian shacks. Much of

the upper part of this valley, near the river, is low and marshy and other parts are gravelly with shallow soil, though there are sections which may offer opportunities for settlement. At present, however, the region is too inaccessible to attract even the promoters, who are so active in the lower Peace River district.

The latter district is booming famously. In Edmonton everyone is talking of the immense possibilities of the great "north country," and people in considerable numbers are going into the country via Lesser Slave Lake. The railroad was completed this year as far as Athabaska Landing (Fig. 19), and it is projected ultimately to the Peace River and to Lake Athabaska.

FIG. 19—Athabaska Landing, the northern terminus of a new railroad from Edmonton, and the gateway to the lower Peace River country.

The town of Grouard, at the head of Lesser Slave Lake, is developing rapidly in anticipation. Among the newest improvements are a frame hotel and a motion picture show, and other buildings are springing up like mushrooms. This is the natural gateway to the lower Peace River country, for which such great hopes are entertained.

At present, the real estate speculators are the most active of the boomers, but there is not a little bona-fide settlement going on. Mixed farming has been tried with considerable success on the plateau west of Lesser Slave Lake, especially in the Grande Prairie region, and some wheat is being raised. The optimists maintain that the lower Peace River valley will make a good wheat country,

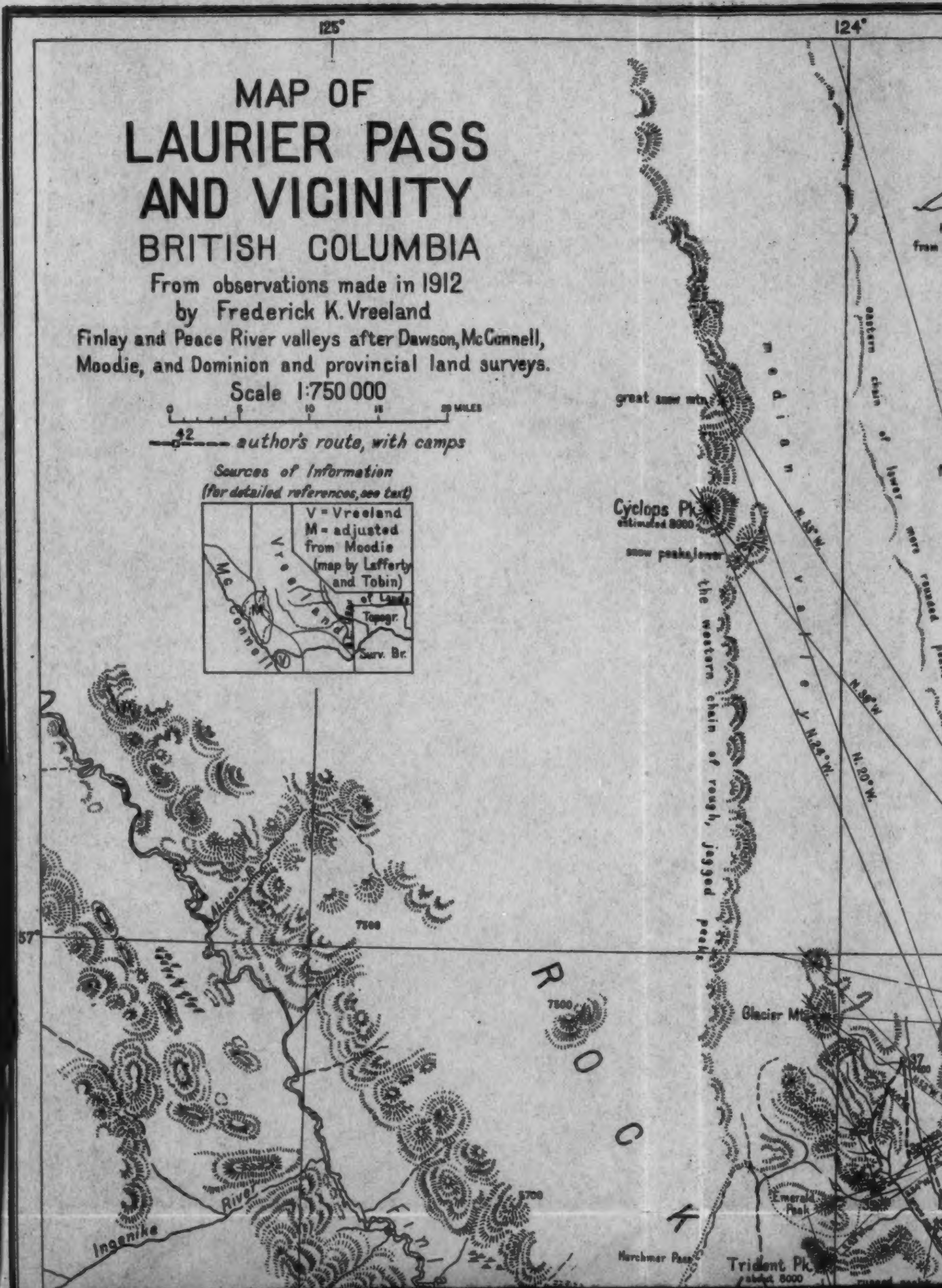
but this remains to be demonstrated. Wheat appears to do well, provided it is not ruined by early frosts. The more conservative promoters think the future of the country lies in the direction of stock raising. The plateau region supports a fine growth of wild hay, which is said to be of excellent quality. On the eastern slope of the mountains, chinook winds moderate the climate, so that the Indians are able to winter their horses in the valleys without feeding, but in the plateau region winter feeding will undoubtedly be necessary.

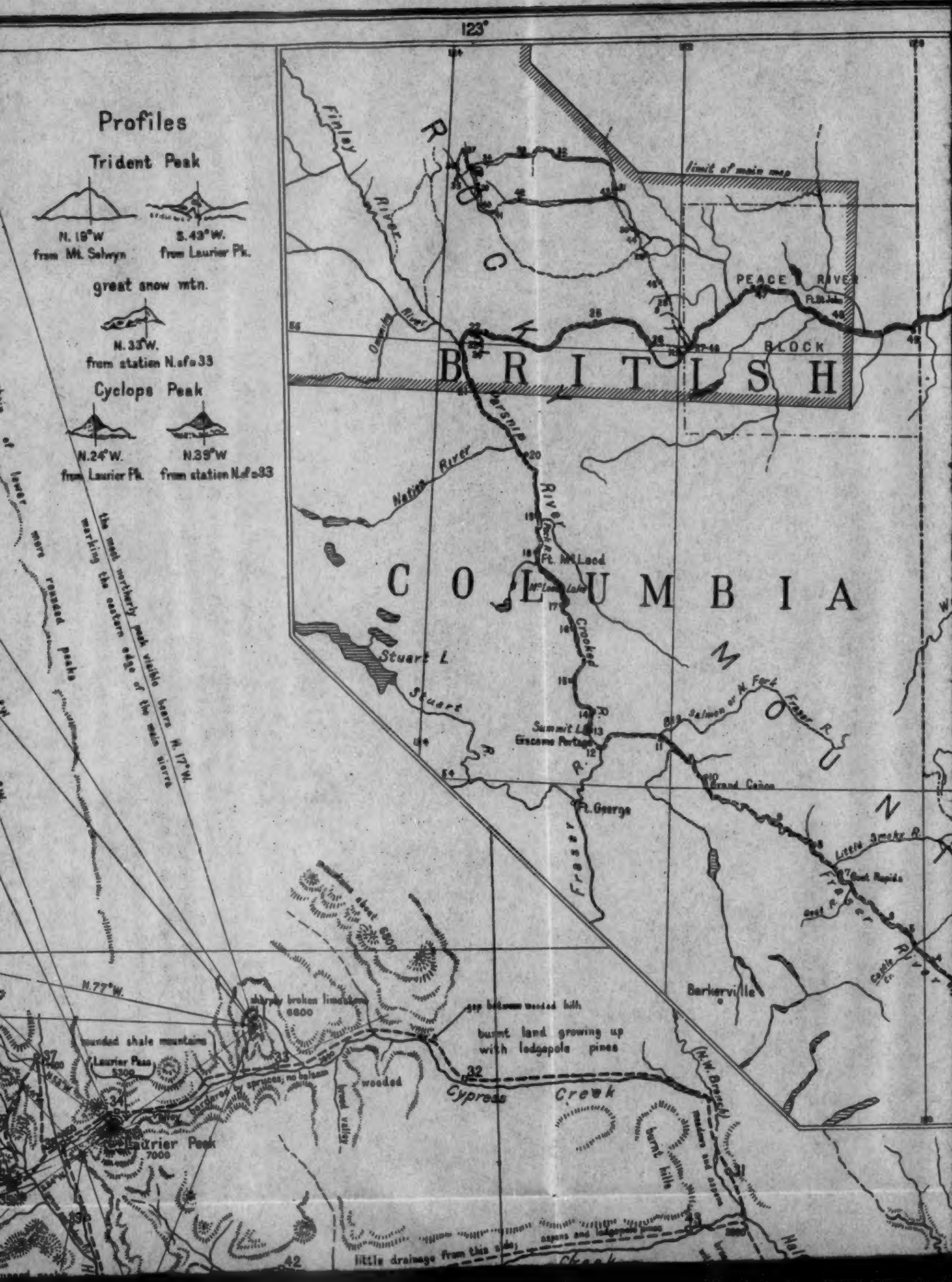
Up to the present, the settlement in the Peace River valley is mainly below Peace River Crossing, though a very few settlers have begun to take up land up the river. Navigation is possible as far as Hudson's Hope, above which the river is effectually blocked by the canyon. The river bottom is fertile, and a variety of garden truck has been raised by the Hudson's Bay men at Dunvegan and Fort St. John, but the available land in the bottom is limited. It is on the plateau 500 to 800 feet above that any future settlers must rely. The steep character of the banks made it impracticable to investigate this plateau personally, so I cannot venture an opinion as to its possibilities.

In the Peace River valley colors of gold are to be found on the gravel bars, but seldom in paying quantities. The source of this supply has not been located, and the mountains are almost entirely unexplored. Mt. Selwyn is composed largely of quartz, which is auriferous, and on the Ominika River, a tributary of the Finlay, placer gold has been found in paying quantities.

Lignite and soft coal are quite widely distributed in the Peace River valley, and it is reported that a high grade of coal approaching anthracite has been found, though I was unable to confirm this very definitely.

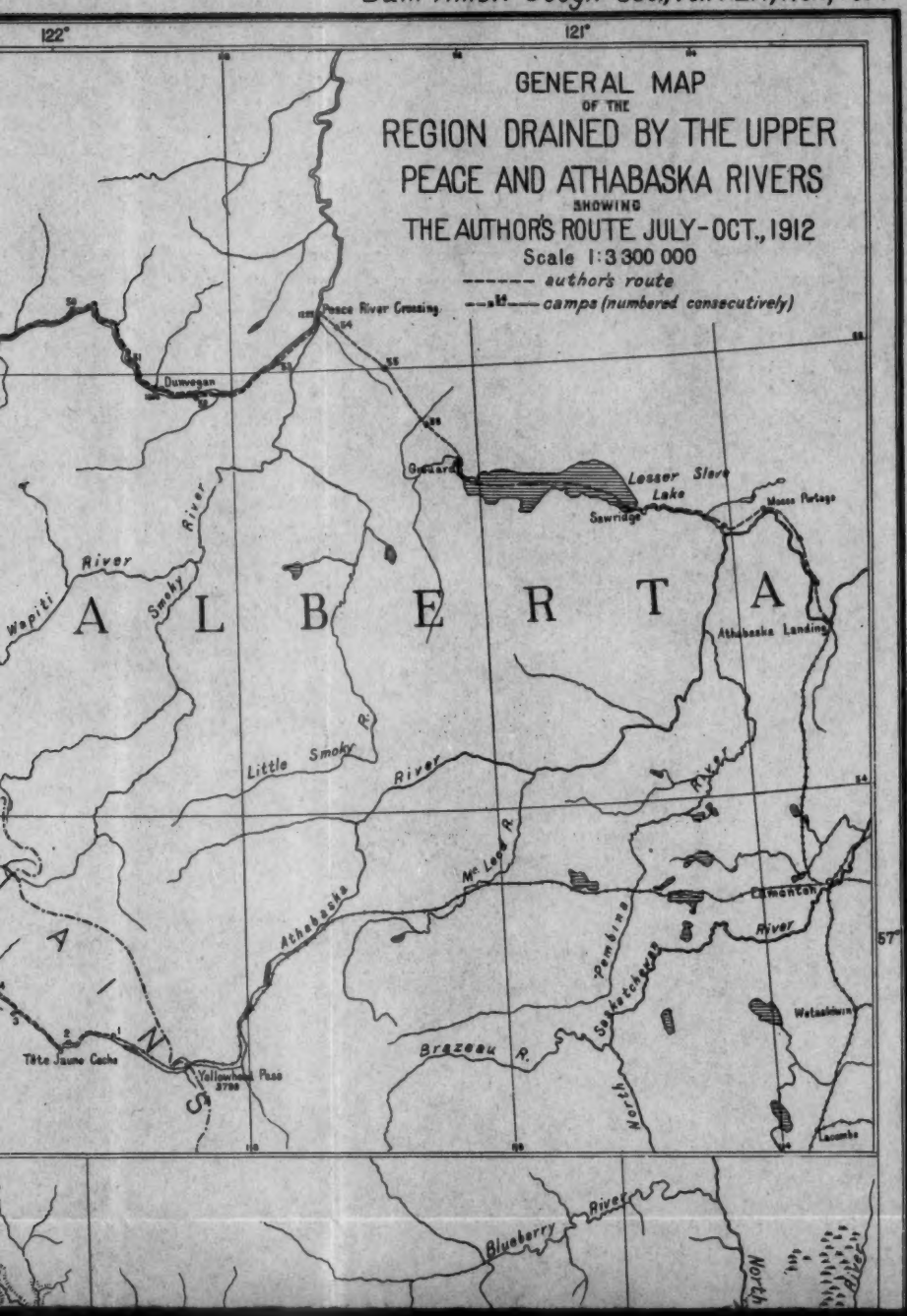
If the present boom conditions continue, these and other resources of the country will doubtless be developed in the near future.


125°
124°
MAP OF
LAURIER PASS
AND VICINITY
BRITISH COLUMBIA
From observations made in 1912
by Frederick K. Vreeland
Finlay and Peace River valleys after Dawson, McConnell,
Moodie, and Dominion and provincial land surveys.
Scale 1:750 000
0 5 10 15 20 MILES
42 author's route, with camps
Sources of Information
(for detailed references, see text)
V = Vreeland
M = adjusted from Moodie (map by Lafferty and Tobin)
Topogr. Surv. Br.
Vreeland
McConnell
great snow mtn.
Cyclops Pk.
snow peaks, lower
median valley
N. 45° W.
N. 36° W.
N. 24° W.
N. 20° W.
the western chain of rough, jagged peaks
eastern chain of lower more rounded peaks
57°
7500
ROCK
Glacier Mt.
Emerald Peak
Trident Pk.
about 8000
Herchmer Pass
Ingenika River
Akie
Fin
5700


123°
Profiles
Trident Peak
N. 15°W from Mt. Selwyn
S. 43°W. from Laurier Pk.
great snow mtn.
N. 33°W. from station N. of 33
Cyclops Peak
N.24°W. from Laurier Pk.
N.39°W from station N. of 33
the most northerly peak visible bears N. 17°W. marking the eastern edge of the main sierra
lower more rounded peaks
Finlay River
Omineca River
limit of main map
PEACE RIVER
Ft. St. John
BLOCK
BRITISH
COLUMBIA
Parsnip River
Nation River
Ft. McLeod
McLeod Lake
Crooked R.
Stuart L.
Stuart R.
Summit L.
Giscome Portage
Salmon or N. Fork Fraser R.
Grand Cañon
Ft. George
Fraser
Little Smoky R.
Goat Rapids
Goat R.
Fraser River
Cariboo Cr.
Barkerville
N.77°W.
shirpy broken limestone 6600
rounded shale mountains
Laurier Pass 5300
Laurier Peak 7000
bordered by spruces; no balsams
wooded
broad valley
gap between wooded hills
burnt land growing up with lodgepole pines
Cypress Creek
burnt hills
meadows and aspens
aspens and lodgepole pines
little drainage from this side
Creek

123°
122°
Profiles
Trident Peak
N. 19°W
Mt. Selwyn
S. 43°W.
from Laurier Pk.
great snow mtn.
N. 33°W.
from station N. of 33
Cyclops Peak
N.24°W.
from Laurier Pk.
N.39°W
from station N. of 33
the most northerly peak visible bears N. 17°W.
marking the eastern edge of the main sierra
limit of main map
PEACE RIVER
BLOCK
BRITISH
COLUMBIA
Finlay
River
Parsnip
River
Nation River
Ft. McLeod
McLeod Lake
Crooked
Stuart L
Stuart
R.
Summit L.
Giscome Portage
Ft. George
Fraser
Grand Cañon
Little Smoky R.
Goat Rapids
Fraser River
Wapiti
Barkerville
Tête Jaune
N.77°W.
rounded shale mountains
Laurier Pass
Laurier Peak
7000
gap between wooded hills
burnt land growing up
with lodgepole pines
wooded
broad valley
Cypress Creek
(N.W. Branch)
burnt hills
little drainage from this side
aspens and lodgepole pines
Creek

Bull. Amer. Geogr. Soc., Vol. XLVI, No. 1, 1914



57°
56°
125°
124°
ROCKY MOUNTAINS
Glacier Mt.
N.77°W.
rounded shale mountains
Laurier Pass
Laurier Peak
7000
Emerald Peak
Trident Pk.
about 8000
rugged peaks limestone?
7500
Horn Cr.
6000 ft.
Herchmer Pass
Ingenika
River
Finlay
Ft. Grahame
Davies Cr.
Collins Cr.
River
Mesilinka
River
Osilinka
River
Ospika River
sharp peak S22°W. 40 miles
N.19°W.
4500
7500
5700
8000
Finlay Rapids
Parsnip R.
Manson River
Mt. Selwyn
about 7500
rugged
Peace
Wicked R.
Bernard R.
Duck Creek
Discovery Cr.
Slate Cr.
Omenica
Germansen
6000
5300
6500
2000

Barkerville
Goat Rapids
Tête Jaune Cache
gap between wooded hills
burnt land growing up with lodgepole pines
wooded
Cypress Creek
(N.W. Branch)
burnt hills
meadows and aspens
little drainage from this side;
aspens and lodgepole pines
Stone Creek
low hills
6000 ft. mountains, becoming lower and lower, rounded
Halfway River
bluff about 2700
Saskatchewan
wooded
mountains visible over 6000
Southwest Branch
Kobes Cr.
wooded ridge
foothills
about 3600 wooded
openly wooded
Chinaman L.
rolling plateau
River
Ottertail River
Wolseley Mt
mountains
Lynx Cr.
123°
122°

Fraser
Barkerville
Little Smoky R.
Fraser River
Tête Jaune Cache
gap between wooded hills
burnt land growing up with lodgepole pines
wooded
32
Cypress Creek
N.W. Branch
burnt hills
31
33
little drainage from this side
aspens and lodgepole pines
42
Stone Creek
Halfway River
low hills
6000 ft. mountains, becoming lower and lower, rounded
41
30
bluff about 2700
44
burnt
wooded
mountains visible over 6000
Southwest Branch
Kobes Cr.
wooded ridge
45
sparsely wooded
28
Chinaman L.
River
Ottertail River
25
26
Peace
Mt. Selwyn
about 7500
Wolseley Mt.
rugged
mountains
123°


Athabaska
Pembina
Edmonton
River
Saskatchewan
Wetaskiwin
Brazeau R.
North
Lacombe
Yellowhead Pass
3730
57°
Blueberry River
North Pine River
Pine River
Saskatchewan
Creek
East Branch
Halfway River
Cache Cr.
Charlie Lake
Red River
Lake
Fort St John
River
Moberly
Pine River
Hudson Hope (327-48)
Moberly Lake
56°
122°
121°

EARLY INTERPRETATIONS OF THE PHYSIOGRAPHY OF NEW YORK

By ALBERT PERRY BRIGHAM

In reading for another purpose, several references to the land forms of New York have been found, which belong to the early years of the nineteenth century. They represent the partial knowledge of that time and often err in description as well in interpretation, but at a number of points they are also prophetic of modern views. It is not in our present purpose to trace the history of thought concerning any of these physiographic features back to ultimate sources, nor to follow the evolution of doctrines to their present stage, but to recall a few descriptions and explanations, which men, with their eyes open, have left on the records of that time. In the history of the science of physiography four score or a hundred years carries us back to ancient times.

In 1795, the brilliant grandson of Jonathan Edwards, Timothy Dwight, who had learned the alphabet at a lesson and read his Bible at the age of four, was elected president of Yale College. Like some other college presidents, he found much to do and found also that he could not endure too much confined and studious life, and he took to travel, kept a journal, and this fruit of his vacations may be found in four volumes, which in their keen and vigorous descriptions of things as he saw them are probably more fresh to-day than the volumes of theology for which he was famous.

One of his journeyings included Niagara. Prior to his comments on the great waterfall he makes an observation whose truth has still to be taught to boys, namely, that the River St. Lawrence is one, from its sources near the Mississippi to its union with the ocean, continuing through the lakes as truly as the Rhone is the Rhone, above or below the Lake of Geneva, and as surely as the Rhine maintains its identity at either end of Lake Constance. He quotes the opinion, even then commonly spoken, that the falls began at the brow of the Queenston precipice. Many had said it in order to give the earth more age than Moses was supposed to have given it. Dr. Dwight is not disturbed, but concedes the recession and quotes Cohoes, Canajoharie and Passaic as other examples. But in these cases recessions have been less, and he proceeds to set forth the reasons in language that would pass in a modern text book. Some stones are of "firmer texture" and therefore less liable to wear: or

are less exposed to "decomposition by the weather," and in some cases the stream is "smaller and less rapid." Certain falls on the Connecticut show rocks so hard and compact that there has been little recession. On the other hand, he thinks Glens Falls have gone back five miles, from Fort Edward. He had himself noted the changes there for fourteeen years, from 1798 to 1812, and had made sketches as a basis of comparison. He urges that Niagara is a powerful river, a hundred times as big as the Hudson or Mohawk. The limestone he thought resembled that of Glens Falls. The rate would depend on seasons and places, and, therefore, "regularity is in no sense attributable to the process." He particularizes as to the mode of wearing at Niagara; the "inferior" parts waste more rapidly than the "superior" parts, there is "continual sprinkling," and he refers to the "attrition of such immense mass of water," and "alternations of heat and cold." He then speculates on the final result, the draining of Erie, perhaps suddenly, with a great deluge below.

But notwithstanding this squint toward cataclysm, Dr. Dwight comes back to his wonted serenity and observes that "on this subject there is no reason for apprehension. Before the waters of Lake Erie can be sensibly affected by the recession, it must have passed through a distance at least three, and probably four times as great as that between Queenston and Niagara." He evidently takes no account here of the dip of the controlling strata, but he is quite as comforting as Mr. Gilbert is, when he considerately defers the final drying of Niagara for about 3,000 years, for Dwight gives us 16,000 years, in case all goes on about as in time past. The river also is wider by three times, and the rock is thicker at the head of the rapids, both serving as retarding conditions, as the recession proceeds. Again he reminds us of one of Mr. Gilbert's papers, in which the uncertain elements of the Niagara problem are thrown into a long list of questions, for Dr. Dwight, with equal caution, says,—"It is to be acknowledged, however, that many uncertainties accompany this inquiry, and that the result of it must be dubious for a variety of reasons."

Some years before Dwight saw Niagara, or in 1787, the falls were visited by Captain Enys. He quotes two arguments as commonly used to show that the cataract was once at "the landing," that is, Lewiston. The first was the abrupt rise of the river banks at that point; but Enys thought more of the second reason, that within man's memory the position of the falls had changed. He comments

on the long time required, but he is specially doubtful about the removal of so much rock by the river. It seemed to him as if the mass of rocks falling at the base of the cataract must have turned the fall into a rapid.

In 1795-1797 Isaac Weld traveled in the United States and commented on changes that had taken place since the discovery of the falls. He interprets recession as due to removal of the under beds and the fall of the upper strata and accepted the idea of the original position at Lewiston.

At about the same time C. F. Volney recognized that the river had hollowed the chasm and carried the breach, from age to age, back to its present position. "There it continues its secular labors with slow but indefatigable activity." He suggests that a precise description of the present state of the cataract ought to be drawn up and that it would become from age to age a valuable document for comparison. This was done by James Hall almost fifty years later.

Mr. John Maude visited the falls in 1800 and published his account in London in 1826. He accepts the prevailing view of recession and adds the interesting information that the falls do not come from a mountainous country as so often asserted but "from one flat country of vast extent to another flat country more lowly situated." As if forecasting the coming century's unending studies and theories of Niagara, he adds—"What a field for speculation!"

Francis Hall, traveling in America in 1816–1817, adds the pertinent observation that the name, *horse shoe,* hitherto given to the larger falls, was no longer applicable, for the shape had become that of an acute angle. He also suggests the possibility of computing the time occupied in the recession from Lewiston. G. Fairholme, in the *Philosophical Magazine and Journal of Science,* computes the probable age of the falls as 4,000 years, but he appears to have been helped in his mathematical operations by the fact that this figure carried the history of the river back to its beginning, the Mosaic Deluge! In that generation, as in this, Niagara was provocative of more study and more discussions than any other single physical feature of the continent.

One of the keenest observations in the early literature of the Great Lakes and Niagara is by G. W. Featherstonhaugh in 1831. "In ancient times when the whole country was under water, and Ontario and Erie were on a level, the cataract of Niagara did not exist; but when the general subsidence of waters took place, when

Erie fell below the level of the Illinois, and Ontario below the level of the Queenston ridge, the waters of Lake Erie would of course take a direction to join the great eastern line of drainage."

About the same time Mr. Grant of the Congressional Committee on Roads and Canals made a reference to the changes of Niagara. Whatever his sources of information, he had not gone beyond the "bursting-of-the-barriers" theory as regards the upper lakes, but he fully recognizes the recession and refers to the fall of Table Rock in 1818 and 1828, the date of his writing being 1838. But he then turns to an interesting speculation about the future. In the recessions to be witnessed by future ages, the crest will "assume a lower plane, until it eventually sinks to, and becomes an element of, a general slope, over which the great volume of the upper lake shall flow." He could hardly use better language for describing the condition of grade to which part of the great drainage floor would be brought. The waters of Lake Erie would recede and there would be a "succession of *berms* converging toward the outlet of Niagara." He thus uses for beaches in general an old word which seems now to be rare and used only in more technical senses. Such berms, says our Congressman, show that similar recessions of Ontario have occurred. He even extends his reasoning to the entire Laurentian system of waters. The St. Lawrence itself may have passed through a waterfall stage similar to that of Niagara, and similar changes may take place between Erie and Huron, as between Huron and Superior. "In a word," he says, these upper barriers "may be worn away by the irresistible waters, and Superior find its way over one continuous and inclined plane, to the broad bosom of the Atlantic."

Dr. Dwight had not been behind, many years before, in foretelling what must happen at the foot of Lake Superior. Referring to evidence that Lake Superior had subsided six feet from some former level, he turns from the specific observations to general principles and urges that the St. Marie is no doubt continually lowering its bed, and that the subsidence of level "can excite no surprise."

It will be natural here to turn to Little Falls and the recession of Lake Ontario. In 1802, the Rev. John Taylor made a missionary tour in the Mohawk and Black River country. On July 27 he visits Little Falls, "a small village of the town of Herkimer." He sees the canal, three-fourths of a mile long, with six locks constructed seven years before. He looks about and thinks it "demonstrably

evident that the waters of the Mohawk, in passing over that fall, were 80 or 90 feet higher in some early period than they are now. The rocks even an hundred feet perpendicular above the present high-water mark are worn in the same manner as those over which the river passes. The rocks are not only worn by the descent of the water, but, in the flat rocks, are many round holes worn by the whirling of stones." He saw holes that were five feet deep and twenty inches across and was sure water had done the work, and he infers, therefore, "that the flats above, and all the low lands for a considerable extent of country, were covered with water and that here there was a lake—but the water, having lowered its bed, laid the lands above dry."

A few days later he stood on the high ground of Steuben, in Oneida County, north of the Mohawk Valley. He looked down on Oneida Lake, across to Clinton and beyond to what he thought were the Catskill Mountains. He was told that from the tops of the trees one could see Lake Ontario, but he seems to have denied himself the pleasure of climbing them. But looking about, he found sea shells in the stones, and he says the land is so high that the shells cannot be accounted for by supposing that the rocks at Little Falls were once united, for this land is evidently much higher than the mountain at that place. He was willing to push his lake westward, but we need not wonder that these stony sea shells did not appear to buttress his theory.

Dr. Dwight's later account of Little Falls is short, but marked by his usual temperance of statement. He makes no doubt that the mountains there were anciently united and that there was a lake above, but he thinks this water was "gradually emptied by the wearing away of the earth and stones which originally filled the gap." Years later, however, a writer who finds place in the volume on the great celebration at the finishing of the Erie Canal, refers to "some mighty convulsion of nature" in which the waters on the west tore a passage through the barriers of mountain granite. This observer's estimate of the width of the gorge may have suffered from the excitement attendant on the festivities of that unique voyage, for he says that at one point "the craggy promontories approximate nearly to the toss of a biscuit."

Much better than this is the reference of Timothy Bigelow, who stopped here in 1805, on his way to Niagara, twenty years before the two historic barrels of Lake Erie water voyaged down the Mohawk Valley along with DeWitt Clinton. Mr. Bigelow notes the

water action on the rocks and the potholes and then says: "It is certain that heretofore the falls must have been much greater than they now are, and that the German flats, and other low grounds near the river above, must have been the bed of a lake." I do not know that Mr. Bigelow was, like Dr. Dwight, a theologian, but he finds at Little Falls evidence of the infidelity of some of the people, who knew Adam was not the first man, or else the Scriptures were wrong in giving him a date, because it must have taken more than 5,000 years for the Mohawk to have broken through the rocks, at this village. One of the most observant persons who saw much of the state of New York in the early part of the last century was William Darby of New York City. Mr. Darby seems to have been a good deal of a traveler, and on the occasion to which we now refer he made a trip to Detroit and the Michigan territory, going by way of the Hudson, Utica, the Thousand Islands, Great Sodus Bay and Niagara, and returning by the south shore of Lake Erie, and by the Cherry Valley route in New York.

He observes of Little Falls that the cataract is due to a chain of granite mountains, of moderate height, crossing the Mohawk here. He considers them as a continuous branch of the Catskills, which he calls the Catsbergs. We would hardly expect this traveler, in 1818, considering the wooded and unsettled condition of the region, to know that the crystalline rocks rise but 150 feet above the stream, and even less where most obvious, or to see that they were surmounted by ordinary sedimentary rocks. He speaks of this as "a region where rivers appear in many instances in their youth." No doubt he did not put into these words a modern physiographer's meaning, but one would like to know exactly what he did mean. He quotes approvingly, and at some length, the views of DeWitt Clinton about the place, a description of which had been quoted by Dr. Mitchell in his notes on Cuvier. Clinton has a great lake to the westward, absorbing Oneida Lake, and by the recession of the waters, some thousands of acres of rich land were uncovered. Rome is recognized as the summit, and the waters drew away from it on each side, leaving on the west the marshes along Wood Creek. "Made ground" was in evidence thereabouts, and logs were encountered at depths of twelve feet. No one would dispute Clinton's closing dictum, as follows: "This great lake, breaking down in the first place the barriers which opposed the progress of its waters to the east, and gradually receding to the west, is a subject well deserving of minute investigation." That the great canal digger could

not know the wide meanings of Iroquois and pro-Iroquois waters, and that he had never heard of glacial dams, nor dreamed of Gilbert or Spencer or Taylor, does not discount his acute appreciation of the importance of the problem.

References to the Ridge Road as a shore of a larger Lake Ontario are abundant and specific. Mr. C. Schultz in 1807 recognizes the ancient Ontario plain and describes the Ridge Road as on a "long, narrow, indented strip of land . . . . . composed entirely of coarse gravel, pebbles, shells and other marine productions," and concludes that it had evidently been the shore, beach, or sand bar of the ancient lake.

Mr. Darby makes several references to the recession of Lake Ontario. He thinks, along with others, that a barrier had been broken through at Quebec, draining a large lake and drawing down the waters, exposing lands about the upper St. Lawrence and Lake Champlain. After the Quebec blockade was cut away, he thinks a similar barrier yielded at the Thousand Islands and that for a long time there was a cataract near where Brockville now is. When this granite mass was cut through, Lake Ontario was much diminished in depth and extent, and then he thinks the cataract of Niagara may have commenced. "If," says our traveler, "a similar effect had been produced in the St. Lawrence that has taken place in the Hudson, then would the Atlantic tides have flowed to Niagara." But what it was that made the submerged channel of the Hudson he does not try to say. He does observe, however, that if the Thousand Islands barrier were entirely removed, much more dry land would appear, but a lake about 250 feet deep would still remain. It would be deeper in fact, but he is assuming 492 feet as the "medium depth of the existing lake."

He also finds evidence of a lowering of surface at Sodus. Around Sodus is a broken surface, but the "fissures" have been worn since the recession of the lake, or as we should say, the ground has been channeled by postglacial erosion. Once on the plain, however, it runs smooth over a wide extent of territory. Plainly, he thinks, the lake has receded at different times. I quote the following sentence. "The natural turnpike (Ridge Road?) is upon the alluvial plain: upon this ancient shore of the lake its waves must have beat many centuries, and yet incontestible evidence exists to prove that, for perhaps so many or more centuries, this lake must have had a surface twenty or thirty feet above the natural turnpike." Not knowing the detailed topography of the Sodus neighborhood, I am unable

to interpret the precise meaning, but whatever he means, he is not sparing of time for these superficial and geologically recent changes. He touches vividly the sluggish drainage of the district north of the lake when he alludes to a creek near Lyons which resembles rather a bayou in lower Louisiana than a water course in the state of New York.

In general remarks, a kind of summary in an appendix, the author takes a further step and presents his idea that "through either the Mohawk or some valley to the southwest of that village (Rome), once flowed the St. Lawrence River. Rome is only 188 feet above Lake Ontario; and the valleys of the Chittenango, perhaps not so high even, were near the sources of that river." The last passage reveals the writer's ignorance of the divide between the Ontario and the Susquehanna waters, as does a later statement in which he says that if Ontario waters were ever 188 feet above the present level, they discharged "either by the Mohawk or Susquehanna or both." He adds that "the chain of small lakes west of Rome (that is, the Finger Lakes) north of the dividing ridge, and east of Genesee River, were once bays of Ontario." Thus we are carried forward to the outlines of the south shores of Warren and Iroquois.

It must be confessed that Mr. Darby's account of Niagara comes closer to rhapsody than to scientific writing, and he makes no scruple of saying that "no man ever did or ever can trace this ground, without the intoxication of enthusiasm." He would have been staggered, perhaps, by the hardened self-possession of some modern observers. When, however, he reached the escarpment he says,—"It is when standing upon the brow of these heights, that the fact becomes demonstrative that here once dashed Niagara, mingling his foaming surge with the wave of Ontario." In the light of the Iroquois beach curving around at Lewiston, this has a modern sound, as does also what soon follows. The fall "continues its slow but certain march to Erie. Time was when Niagara did not exist and time will come when it will cease to be."

In one passage the Mohawk is said to occupy the "narrow vale of two exhausted lakes." One of these was, of course, to the west, and the other, as he thought, reached up to Little Falls from the Highlands of the Hudson. For he held the usual theory of older days that the Middle Hudson, even up to Hadley's Falls, was the bed of a lake which finally burst the Highland barrier. Darby observes that streams from both sides enter the Hudson by falls, and

he notes that streams on the west have a northwest direction, and on the east they flow to the southwest. He makes no reference to the control of the mountain axes, and was three-fourths of a century too early for the term longitudinal. He argues that the lower Hudson is a bay rather than a river, and then follows perhaps the most interesting physiographic reference in the volume. "By what process of nature did the Hudson scoop its present channel, so far beneath the bottom of the former inland sea, so far even beneath the level of the ocean, and through a continuous mass of rock? If you can answer this query you will do me and the world a favor. I am unable to even conjecture the process of this mighty, this unequalled work."

Going north from Utica, Darby observed the Utica shale, calling it "secondary mica slate," and the big crystalline boulders, which he calls pebbles. He owns that he cannot explain them, but is sure that neither fluid nor frozen water could have done the work. Notwithstanding his disclaimer, he cannot resist trying his hand with the usual Canadian Sea, flowing south over a surface that was "uniform through inclining." But after all, twenty years later, Hall and Vanuxem and Hitchcock were struggling with the same problems, while their greater body of facts made the puzzle more perplexing. Darby observes the scanty soil on the limestone in Jefferson County, but does not try to explain it. He also refers to the Nipissing route from Lake Huron to the Ottawa River, and to an intended canal by Lake Simcoe which would shorten the distance from Michilimackinac to York, Canada, to 350 miles as compared with 650 by the Niagara route.

Among the drumlins of western New York, to which he refers as ridges parallel to each other and to the chain of lakes, he finds himself astonished as he rises and falls with the passage of the road over them. And he observes that if their intervening valleys were filled with water, a cluster of islands would be produced of astonishing resemblance to that of the Gallops in the St. Lawrence River. "The ridges have the same globular swell which you will remember, I have noted, as characteristic of the features of the Gallops." These islands are in the river below Ogdensburg and are not to be confused with the Gallops in the northeast part of Lake Ontario. The rising of the water on the drumlins, combined with the reference to the islands of the St. Lawrence, inevitably recalls Mr. Wilson's recent paper before the Geological Society of America, in which he recognizes the islands and headlines of the Sackett's

Harbor and Thousand Islands region as due to headwater dissection by the members of a great stream, and subsequent partial submergence. Darby notes the peculiar features of that region when he says it is "difficult to mark with precision the termination of Lake Ontario, or the commencement of the Cataraqui or St. Lawrence River." He cites the Schoharie River as showing how little the mountains of the United States influence the direction of its streams: but he shows that he had been affected by Hutton or some other modern influence when he says, "I have long been of opinion that the accidental agency of earthquakes and volcanoes has been overrated, whilst the slow, but constant influence of water has met with too little attention from philosophers and naturalists." This, we should remember, was twelve years before the first volume of Lyell's Principles came from the press.

Old notions of the "Alleghany Mountains" are so confused that it is difficult to understand or to quote them. One of the familiar phrases of the voluminous Erie Canal literature is Mr. Christopher Colles's dictum that the Alleghany Mountains die away as they approach the Mohawk, and the long Rochester and Utica levels of the canal are cited in proof of this. The escarpment at Lockport, surmounted by the great chain of locks, was commonly called the "Mountain Ridge" and, as I suppose, was counted a part of the Alleghanies. Dr. Dwight fully shares the ignorance of his time. He went west by way of the Catskills, Otsego and the Chenango Valley, and considers the "Katskills" by far the highest land in the state. The Alleghany range, according to him, "terminates near the headwaters of the Genesee River, and is visible from the great Western Road to Niagara." This is not clear as to his view, for it is not open to us to believe that he saw a hundred miles across the uplands of western New York. But he does pretty well in his reference to the space between the Kaatskill and its dependencies on the one hand, and his hypothetical Alleghany range on the other. It is the region of the Susquehanna headwaters, and he describes it,—"as filled up with hills and valleys, running in a great variety of directions, so great that to the eye on elevated ground the whole region appears to be a mere mass of confusion."

Mr. Darby describes what he calls a "remarkable chain of hills" separating the Ohio and St. Lawrence waters. He traces the divide in detail especially in New York and around the head of the Genesee, and describes the "ridge" as falling abruptly to the north, and sloping gently to the south. He also refers to it as "this singular spine south of Lake Erie" and observes that it divides a country

full of lakes from a region in which lakes are rare. He elsewhere speaks of this ridge as the "spine of the Alleghany," and as he recognizes a granite nucleus of this mountain system, we must suppose that he had some notion of the more primitive elevations that extend from the New York Highlands to the southward, and regarded the "spine" as a great westward branch of the system.

Mr. Elkanah Watson wrote a book on his travels in New York and his views of canals, emphasizing his personal claims as to the original projection of the Great Western Canal. Except for the line of levels through the state, he seems almost as blind to the topography as Mr. Darby is alert and of open eye. But he does appreciate, without the slightest inquiry as to its origin, the symmetry of the land between Seneca and Cayuga Lakes. The land he says rises gradually from opposite shores, and almost leads one to believe that the whole country is the work of art. Any one familiar with Finger Lake topography will appreciate this lone bit amid Mr. Watson's rush of enthusiasm about ditches, settlers and the growth of a glorious country.

We must not omit an early Onondaga writer's allusions to the volcanic theory of salt. In ancient days when yet the sea covered the earth, a vast eruption evaporated so much sea water that bodies of fossil salt resulted. But our writer warily says,—"We are inclined to no particular theory." He does not seem to care how the salt was made, and is only afraid that it may sometime give out.

Few features of New York are of deeper interest than the abandoned river courses through which the glacial waters escaped in the descent from the Warren to the Iroquois plains. Near Syracuse are the gorges or amphitheatres which hold the so-called Green Lakes of Jamesville and Fayetteville. We know these splendid limestone cliffs as produced in the recession of great cataracts of late glacial time. But they had long been an occasion of speculation among local wise men, and a history of the town of Manlius, by a local historian, refers to the theory that these basins are volcanic craters. "But," says he, "the more settled geological opinion holds to the downsinking of the areas, that is, by the subsidence of a fault block."

We have looked back fourscore or a hundred years, enough to appreciate the ignorance and the partial knowledge of those times, but to little purpose if we do not also appreciate the keen interest, the sober thought, the shrewd guesses, and the acute prophetic glimpses of facts and principles, that have a settled place in modern physiography.

NOTES ON THE DESCRIPTION OF LAND FORMS—XI

The Physical Features of Morocco.

LE MAROC PHYSIQUE. By Louis Gentil. 320 pp. F. Alcan, Paris, 1912.

The distinguished explorer of Morocco, Louis Gentil, Professor of Geology at the Sorbonne, has lately prepared a serviceable summary of the physical features of that country, to the knowledge of which he has so largely contributed. Certain chapters of his book will afford geographers excellent information regarding matters of fact, and will at the same time exhibit the manner in which the division of their science that is concerned with land forms is treated by an expert geologist. The book opens with a brief empirical description, excellent of its kind, in which the larger physiographic divisions of Morocco are concisely set forth. Then follow nearly 30 pages regarding the growth of scientific knowledge of that country, over 60 pages on its geological history, and 60 more on the rôle of the two Moroccan mountain systems in the orography of North Africa; the larger system being the Atlas, consisting of several ranges which extend southwest from Algiers to the Atlantic, and the smaller one being the Rif (or Little Atlas) which forms a curve convex to the south in the northern part of the country, with its western arm pointing to the Strait of Gibraltar, across which it is continued northeastward in the mountains of southeastern Spain. Two chapters on the relief of the surface and the evolution of the drainage lines, of which more below, are discussed in 35 and 40 pages respectively; after which climate, vegetation and soils are allotted chapters of somewhat less length.

A peculiar feature of the chapter on Relief or Surface Forms is found in its geological classification and treatment. Its chief sections are:— (1) Influence of Primary (Paleozoic) folding, under which it appears, for example, that a west-central area, bordering the Atlantic and called the Moroccan Meseta or Tableland, is largely covered with horizontal strata of Secondary or Tertiary age, but that in certain districts the removal of the covering strata reveals an underlying body of folded primary strata, for the most part reduced to a peneplain, yet here and there surmounted by ridges of the most resistant strata. (2) Influence of Tertiary folding; here are placed, for example, the several ranges of the Atlas system, in one of which certain anticlines of Mesozoic strata are well preserved while others are breached along their crest, and hence this range is regarded as "very young" (171); but in treating the complete anticlines as "preserving their original form," the author gives at least some of his readers an under-impression of the erosion that has taken place. (3) Influence of epirogenic movements and great faults; here one finds an account of successive broad elevations and depressions without significant deformation, one of the most recent and interesting examples being that by which a former passage between the Atlantic and the Mediterranean, south of the curved range of the Rif, was laid dry, and a gap in this system between the Rif and the mountains of southeastern Spain was submerged to form the Strait of Gibraltar; brief mention is also made of strong faults of relatively modern date, which limit the central mass of the High Atlas on both sides, but their influence

on the present landscape is not here (177, 181) explicitly stated; only farther on in the chapter on the evolution of drainage is the southeastern fault escarpment said to be "furrowed by deep valleys which follow the line of most rapid slope," while at the opening of the valleys on the piedmont plain the spurs between them terminate in facets, "which testify to the relative youth of the form of the range" (212). (4) Relation of relief to rocks, such as granites, which appear in the High Atlas and form part of its crest; limestones, of which the more resistant beds, where folded in the Atlas ranges, produce a Jura-like topography, emphasized by the dryness of the climate, or where lying horizontal, as in the eastern plateau bordering Algeria, determine tabular forms; while the weaker beds, as in the cover of the Meseta on the west, have softer forms; volcanic rocks, of which one large mass known as Siroua, lies on an elevated granite peneplain in the heart of the mountains, and once resembled Etna of to-day, but is now dissected like the Cantal of central France; and so on, with slates, sandstones and other kinds of strata.

It is to be noted that while the descriptions of surface forms in this chapter sometimes place the present result of erosional processes acting on structural masses in the foreground, prominence is given quite as often to the past action of erosional processes on structural masses; that is, the treatment of the surface is as largely geological as it is physiographic; and further that while technical geological terminology is freely employed wherever wanted, a correspondingly technical physiographic terminology is avoided even where it might be helpful.

The chapter on the evolution of drainage presents many details which serve to amplify and complete the physiographic pictures outlined on earlier pages; but it is a question whether, in order to avoid incompleteness there or repetition here, it would not have been better to treat the problems of relief and drainage together. For example, the earlier description of breached anticlines (171) is now in part repeated in connection with the explanation of their axial valleys, which are here as before said to be "bordered by monoclinal crests" (207); the earlier description of the dissected volcano of Siroua (200) is now partly duplicated in the explanation of its radial valleys (213); and the earlier mention of the laying dry of the ancient strait between the Atlantic and the Mediterranean (178) is now in part repeated in the discussion of its drainage (205). Further, the postponement to this chapter of the statement that "the carboniferous folds have imposed, in the paleozoic region of the Atlas, a general direction on the principal valleys which descend from the crests to the great plain of Haouz" (206), leaves the previous statement regarding the relief of this district (167) essentially incomplete. Physiographic terminology is here again little advanced from its elementary incompleteness in the previous chapter. True, the drainage of the folded limestones in the High Atlas is said to have a very close adjustment to the structure (208), but in the absence of a concisely phrased account of the hard and soft beds involved in the folding, the reader is left with an abstract generality in place of a specific landscape. Again, "It is natural to think that phenomena of capture have been frequent in the evolution of the drainage of the High Atlas" (208), and several examples of capture are mentioned; but usually without concise indication of those significant details of visible existing form, the observation and description of which are both so much favored by the possession of a systematic terminology—

because the possession of such a terminology implies the understanding of the elements of form to which the terms apply. Likewise, the tabular limestone region of the Algerian-Moroccan border, briefly mentioned under limestone reliefs (191) but not referred to in connection with "great faults" (177), is now described as divided into a number of fault blocks, trending E.N.E.–W.S.W., with uplift on the southeast, thus forming a flight of steps with broad tread and relatively small rise (221); it is thus implied that the steps are directly due to faulting, but in the absence of a terminology which discriminates between fault-scarps (due to faulting) and fault-line scarps (due to erosion of a faulted structure) the lack of critical discrimination as to the nature of the steps is expectable. It may, of course, be urged that a volume of a "Nouvelle Collection Scientifique" ought not to be too technical, and that various physiographic terms, the absence of which is here regretted, have therefore been wisely excluded: yet in earlier chapters one finds an abundance of technical geological terms, such as beds with *Pleurotomas*, Burdigalian sediments, calcareous marls with *Harpoceras opalinum*, structures of Caledonian, Hercynian or Armorican trend, which are just as definitely helpful in the paragraphs where they occur as physiographic terms might be in the chapters on relief and drainage where they are now lacking.

To studious readers, interested not only in the geography of Morocco, but also in the development of a thoroughly disciplinary and intelligible method of regional physiographic description by intentional experimentation with many methods, and the eventual selection of one that will best serve the ends in view, Gentil's book is welcome and helpful on several grounds. The first ground is of course the truly intimate acquaintance with many facts of Moroccan structure and form that has been gained by this ardent explorer through his own field work and through comprehensive reading; for manifestly no good experiment in description can be made by one who is ignorant of the things that he wishes to describe. Another ground for gratitude is the thorough test here given to the method of describing surface relief on a geological plan, for the value of such a method can be discovered only by giving it a fair trial, and the fairest trial is secured from an author who likes the method and who publishes the application that he makes of it; but in the present writer's opinion, the result of the trial does not recommend the method for further use in regional geography, because it too frequently requires that several diverse elements of a single landscape, closely associated in their natural occurrence, should be described on far-separated pages in association with systematically similar but geographically distant elements. An additional feature of the author's method is the interesting device of treating the evolution of drainage after and to that extent apart from the description of surface relief; for here again the merit of the device can be measured best by submitting it to a serious test in friendly hands and then publishing the results; but as before, the results do not commend the device for further use in regional description.

Another matter, by no means limited to this book but brought forward by it, is the important problem concerning the best use of local place-names as guides to the location of physiographic features. Place-names abound on Gentil's pages, and as the simple outline map in the text contains very few of them, their location must be looked up elsewhere. This is usually done as a matter of necessity, even as a matter of course by the persistent reader

of geographical essays; the problem here raised involves a difficulty of another kind, namely, the use of a local, little-known place-name as a means of locating a perfectly conceivable physiographic detail. I believe that this is not consistent with the best geographical usage, which demands that—apart from widely known place-names, like Gibraltar—physiographic details should be located in relation to larger physiographic elements, and these again in relation to still larger physiographic features, the general positions of which are stated at the outset, as is done in the first pages of Gentil's book for the chief physiographic provinces of Morocco. After a physiographic detail has thus been located, the little-known place-name associated with it may be introduced; if this order is reversed, the difficulty of forming correct mental pictures of the districts described is greatly increased.

The use of little-known place-names as guides to the location of physiographic features adds to the difficulty in books which, like Gentil's, have no index. Consider, for examplpe, the statement that granitic rocks extend from the crests of the High Atlas almost to "Tazenakht" (180). This name being unknown to many readers, the extension of the granites is vague as to direction and distance: therefore a rapid search may be made for Tazenakht (few readers have time for a careful search) through the earlier pages descriptive of the High Atlas, and if it is not found there, it must be looked for on such large-scale map of Morocco as may be accessible. In my own case, the name "Tasenacht" was found on a German map; it appears to be a village lying, as might well have been said in the text, "about 60 kilometers southeast of the mountain crest on the border of the Saharan plateau" (a feature previously explained): thereupon the extension of the granitic area becomes sufficiently definite. The addition of phrases like the one here suggested would increase the size of the book, and its intelligibility as well.

Finally comes the problem of verbal description without the aid of diagrams. There are only two black and white maps of small scale, and no sections or figures in "Le Maroc Physique"; hence the insufficience of graphic aids must be regarded as its chief defect. The reader would be greatly assisted in understanding, for example, the general relation of the Saharan plateau to the southeastern slope of the Atlas by means of a section, or still better by a block diagram; no such assistance being given, the relation remains uncertain and the reader unsatisfied.

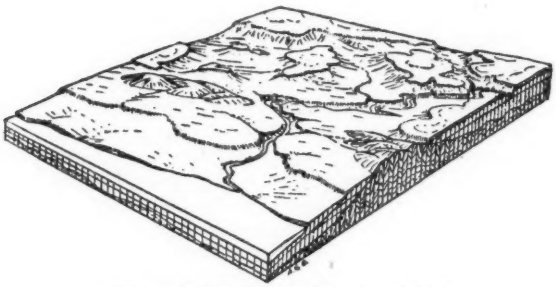
Theory and Use of Block-diagrams.

La Théorie du Bloc-Diagram. By Paul Castlenau. *Bull. Soc. de Topog. de France*, Vol. 36, 1912. 16 pp.

Apropos of the closing lines of the preceding note, attention may be called to the above-cited article on the theory and method of construction of block diagrams, from which an increase in the use of this graphic device by French geographers may be hoped for. The discussion of the theory is, however, limited mostly to the geometrical elements of formal perspetive, and the the representation of non-geometrical surface forms is unfortunately but little considered. The essay closes with excellent advice:—"The chief thing is to make a beginning, without allowing oneself to be discouraged with the first unfruitful trials."

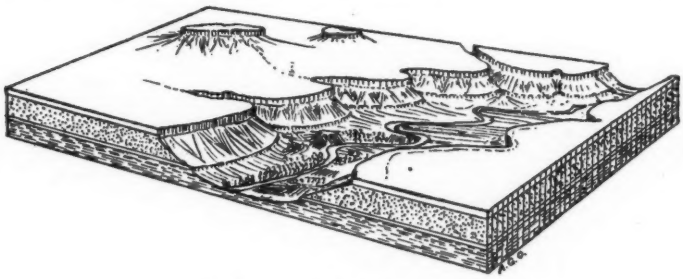
NOTES ON MOROCCAN GEOGRAPHY. By A. G. Ogilvie. *Geogr. Journ.*, Vol. 41, 1913, pp. 231-237.

Ogilvie here returns to a subject he has already treated (''Morocco and Its Future,'' *Geogr. Journ.*, Vol. 39, 1912, pp. 554-569), following Gentil; but while his previous article had no illustrations, the present one is embellished by a number of good photographs by the French explorer and elucidated by several diagrams. Two of these show in simplified bird's-eye views the leading features of relief before and after the formation of the Strait of Gibraltar; the drawing is rude but immediately helpful. Two others are block diagrams, here



Landforms of the Meseta border and coastal plain.

reproduced; the smaller one, which might well have been a little larger, so as to use the whole breadth of the page instead of wasting space in blank paper, presents the leading features of the Meseta; namely, tabular forms (''Gour'') of dissected horizontal strata, through which rise rounded ridges (''Sokhrat'') of the resistant foundation rocks; while a simple coastal plain slopes from a series of abandoned sea cliffs in the western margin of the Meseta to the



Form of a valley in the Meseta.

Atlantic sea cliffs of to-day. The other diagram exhibits on a larger scale the tabular Meseta traversed by an open valley, in which water is ''usually to be found, either as a running stream or more commonly oozing out as springs from the valley sides.'' If Gentil's book had contained a number of such block-diagrams its value would have been thereby much increased.

Physiography as a Basis of Political History.

THE BALKAN PENINSULA. By D. G. Hogarth. *Geogr. Journ.*, Vol. 41, 1913, pp. 325-336.

One of the reasons for regretting the geological scheme of geographical description in Gentil's book, noticed above, is that it does not provide a sufficiently connected picture of physiographic districts, which might afterwards serve as a basis for historical, political or economic studies. The same may be said of many geomorphological studies of the modern German school, in which regional physiographic phrases are often so deeply buried in a mass of geological detail as to discourage any historian or economist from searching them out; it is difficult enough for a geographer to find them! Perhaps it is because of the relative unfitness of modern physiographical material, that so little use of it is made as a basis for studies in other subjects where geographers at least believe it might be useful.

On the other hand, the kind of physiographical basis that some writers do use in their historico-political studies is in certain aspects disappointing, to say the least. Consider, for example, the paper cited at the head of this note. It is an anthropogeographical address by an expert who has devoted the last twenty-five years with little intermission to the exploration, chiefly archeological, of the Near East, and who here proposes to "state the influence which geographical conditions . . . have had on the societies of this Balkan area . . . To do this one must take account of history to some extent; but only so far as history has been conditioned by geography." The interest of the address in the present connection lies in the method adopted in the description of the physical features by which Balkan history is believed to have been conditioned. That a speaker before a general audience should employ a very elementary and wholly empirical method of physiographic description is proper enough, even if the audience represents the general membership of one of the most distinguished geographical societies in the world, for such audiences have no technical understanding of scientific geography; but whether an elementary empirical style should be preserved in the printed record of the address, when published in a leading geographical journal, is open to question. Still, much of the description seems to be sufficiently intelligible for the author's purpose. For example, after describing the so-called peninsula as divided by mountain ranges into several north-south belts, the author says that the greater part of Albania in the western belt consists of "a series of long and very narrow valleys running across . . . from an almost impassable mountain spine at the eastern frontier to the sea, which is fringed with inhospitable malarious strips filling short intervals between high rocky spurs. The flanking ridges confining the valleys are very high and steep. These features are most fully developed in central Albania." Farther south are "short lateral ranges curving back from the main eastern spine and enclosing small plains."

The phrasing of the descriptions is, however, too often vague and variable; if such deficiencies are hardly avoidable in a spoken address, they are easily corrected in its printed form. The use of two terms for one thing, as when the "narrow valleys" that cross the western belt are later described as "long transverse furrows," violates the fundamental principle of using only one term for one thing. Such a phrase as "ranges curving back from the spine" is so indefinite that it must lead to various mental pictures in the minds of

various hearers; "spine" as here used of course means "backbone," and not such a spine as was temporarily formed on Mt. Pelée. "Rough and shaggy hills" and "shaggy hill country" are truly suggestive expressions, but most readers in applying the latter phrase to the dissected uplands west of the Bosphorus will overrate their ruggedness. But the most ill-judged terms are found in the description of certain north-south and east-west mountain ranges as "vertical" and "horizontal"; as if the speaker were a poorly taught schoolboy talking about a map hanging on a wall, instead o a practiced traveler describing the country that he has repeatedly traversed. The phrases in which these blunders occur are as follows:—"The southern part of the peninsula, which is very largely mountainous, displays two orographic features, which have exercised a constant influence on its history and will always control its destiny. In the first place the main lines of its mountainous structure are disposed vertically . . . from northward to southward. In the second place, the slopes leading up to the horizontal mountain system which divides it from the northern part of the peninsula . . . are much steeper than the slopes downwards on the north side of the range . . . Each of the main vertical belts —four in number—into which the peninsula is divided, is marked out by nature, therefore, either to be an independent self-contained unit, or to be combined" etc. That an address delivered in a hall which the speaker referred to as a "temple of exact geography" should describe mountain ranges as "vertical" and "horizontal" is simply amazing. One would think that even a proof-reader might have corrected such errors as these.

The general geographical elements of position and distance by which the Balkan peninsula is related to neighboring countries are well treated in the earlier pages. One of the economic lessons exemplified by several instances falls under the well-known rule that movement tends to follow open lowland paths and that it is blocked by high and rugged mountain barriers. The chief political lesson is that a rough country develops clannishness among the inhabitants of its depressions and basins, and makes centralized government difficult. Both of these lessons would, I believe, have been more effectively taught, had greater emphasis been given to the generality of the rules under which the local instances fall. An interesting ethnic lesson is that religious communion exerts more control than race in grouping the population; but this seems independent of physiographic factors. A point of more physiographic import is that "whatever the Powers may wish, or the Balkan allies extort, or the Turks contrive," the scientific frontier between the parts of Europe and Asia here adjoining lies, not along the water passages between the Black Sea and the Mediterranean, but about fifty miles farther west where the open Rumelian lowland breaks the uplands in which the narrow "trough-like gap" of the Bosphorus and the Dardanelles, in good part drowned river valleys, are relatively narrow interruptions. No wonder that the address was listened to with "enrapt interest" and characterized as "very lucid and instructive," for it treats historical and political topics of live importance to-day; but as anthropogeography it is disappointing in being so largely "anthropic" and so little geographic.

W. M. Davis.

HYDROGRAPHICAL WORK ON THE RUSSIAN SHORES OF THE PACIFIC*

About fifteen years ago a special hydrographical expedition was organized in the Russian Far East for the purpose of surveying the Russian shores of the Bering, Okhotsk, and Japan Seas. The work has been interrupted several times, as, for instance, in 1900, during the Boxer troubles, when the entire force of the expedition had to join the navy; in 1904-1905, during the Russo-Japanese war, when the whole force again joined the navy, and in 1906-1907, when the expedition had no vessel.

The first years after its organization, this expedition worked in Kwantung waters, made a survey of Korea Bay between Port Arthur and the Yalu River, of the mouth of the river and the islands in the bay, *viz.*, Elliot, Blonde and Bourchier. In Liaotung Gulf a survey was made of the western shores of the Kwantung Peninsula and the adjoining islands, and soundings of the shore waters. This work resulted in the making of twenty-two entirely new maps. In 1908 work was continued only about one month, owing to the late arrival of the steamer *Okhotsk*, which was purchased in England.

From 1909 to 1911 inclusive, the expedition made the following surveys on the coasts of Kamchatka, the Sea of Okhotsk, the Gulf of Tartary and the Japan Sea, enumerated in order from north to south. On the eastern coast of Kamchatka the new surveys included Baron Korf Bay (60° N. and 165½° E.), the coast from Cape Ilpinski to Cape Ozernoi (60° to 57½° N.) and from Cape Kronotski to Petropavlovsk (55° to 53° N.), and the harbor of Petropavlovsk and Avatcha Bay, on which it lies. The small peninsula which ends in Cape Lopatka, the southernmost tip of Kamchatka, was also surveyed. Of the western coast of Kamchatka that part which lies between the mouths of the Kambal and Ichi Rivers was surveyed. On the northern coast of the Sea of Okhotsk surveys were made of Yama Bay (59° N. and 155° E.) with detailed soundings for anchorages [this map was listed in the *Bull.* under "Siberian Coasts," (b), Vol. 43, 1911, p. 799], of Eirineisk Bay (59° N. and 146° E.), of the coast from here west to the town of Okhotsk (59° and 143° E.) and of this town and its roadstead. The position of the mouth of the Ooli River [Ulya? (59° N. and 142° E.)] was determined. In the western embayment of the Sea of Okhotsk the strait between Great Shantar and Little Shantar Island was surveyed; also Mamga Harbor (54⅓° N. and 126⅔° E.) on the western side of Tugur Bay. In the Gulf of Tartary detailed surveys were made, on Sakhalin Island, of the following bays: Shastye, Chaivo, Piltun, Pilevo, Tetuhe and Viakhta; and, on the mainland, of De Castries Bay (57½° N.). The reef near Zolotoi promontory was also surveyed and soundings of the western half of the Amur River estuary were made in great detail.

Sixty-eight astronomical and 220 trigonometrical points were fixed and used as a basis for the preparation of maps; 2,000 versts (1,326 miles) of the

* Published from report of Consul John F. Jewell, by kind permission of the Bureau of Foreign and Domestic Commerce, Washington, D. C.

shore line were taken by circumferentor; 300 points were fixed by geodetical methods; 150 versts (100 miles) of the Okhotsk Sea were charted; the soundings made covered 25,000 versts (16,572 miles); 8,000 depths were taken; 10,000 versts (6,667 miles) of soundings, and 280,000 soundings were made from row boats, and about 5,000 soundings were made in ice.

In addition a great deal of work was done in connection with the study of currents, the temperature and the specific gravity of sea water, studies of the flora and the fauna of the sea, studies of terrestrial magnetism and earth refraction, meteorological elements and measuring of the changes of gravity with the Sterneck pendulum.

Being supplied by the Hydrographic Office with necessary instruments and outfit, the expedition established 53 deep water stations at which 97 faunal soundings and researches were made. This work, being done by means of trawlers and dredgings, has produced several thousands of sea animals, which were sent to the zoological museum, Imperial Academy of Science, St. Petersburg, and to the museum of the Priamur District at Khabarovsk. Exact magnetic studies were made at 208 points, and in 173 cases the earth's refraction was determined. The tides were studied at 66 points and tidal currents in 60 places. For the purpose of studying sea currents, 10,000 bottles were thrown into the sea.

In 1912 the expedition continued its work on the northern shores of the Okhotsk Sea and the Amur estuary. A survey of the Okhotsk shores was made from Eirineisk Bay almost up to Ola (151¼° E.) so that this whole stretch of coast is now correctly mapped. In this region detailed surveys were also made of Kulka Bay, Spafarieff (Korovyi) Island, Nagaeff (Volak) Bay, Shestakoff Bay and anchoring places in the mouth of the Ireti. This work is of special interest as it settles the question of harbors in the Okhotsk Sea, where before no safe harbors were known, and changes into a place of refuge a region that was a graveyard for vessels.

New and safe anchorages were found on Spafarieff Island (Bering Bay), and opposite it on the mainland in Shestakoff Bay. The third bay discovered by the expedition was named Nagaeff Bay, in honor of the first Russian hydrographer. In the Gulf of Tartary, Frederic Bay, near DeCastries Bay (51½° N. and 141° E.) was surveyed in detail from row boats. Phusun Bay was also surveyed.

In figures, the work of the expedition in 1912 consisted of the following: Ten astronomical and twenty-six trigonometrical points were fixed; exact magnetical studies were made at twenty-three points; 300 versts (200 miles) of sea shore were measured by traverse, 470 versts (312 miles) by survey from the ship, and 5,000 versts (3,314 miles) by soundings; 2,000 depths were sounded: 1,500 versts (994 miles) were surveyed and 32,000 soundings were made from row boats; the height of 630 points were determined by geodetical surveying, and twenty-nine deep water stations were established; in twenty-one places researches were made by means of trawlers and dredgings; 198 species of animals and 1,100 samples of plants were collected; and in twenty places the earth's refraction was measured 200 times.

GEOGRAPHICAL RECORD

THE AMERICAN GEOGRAPHICAL SOCIETY

Meetings of the Society. The first regular meeting of the Society for the season of 1913-1914 was held at the Engineering Societies' Building, No. 29 West 39th Street, on Tuesday evening, November 25, 1913. Vice-President Greenough in the Chair. The following persons, twenty-four in number, recommended by the Council, were elected to Fellowship:

William T. Blaine,
Ammi Brown,
Prof. Dr. George Hatjidakis,
Mrs. Austin Huntington,
Charles C. Jackson,
C. L. Jainee,
Miss Mary L. Jobe,
Hiram Dyer McCaskey,
Charles V. Miller,
John R. Morrow,
Miss Mary Proctor,
John Knowlton Robinson,
John Jacob Rothermel,
Henry Clay Shaw,
Alvin Untermyer,
T. Wayland Vaughan,
William F. W. Veysey,
Frederick K. Vreeland,
Charles H. Weigle,
William Young Westervelt,
Guill S. Whitehouse.
Orme Wilson, Jr.,
Clark Wissler,
Charles Zoller,

Professor Hiram Bingham, A.M., Ph.D., of Yale University, then addressed the Society on "The Land of the Incas" with lantern illustrations.

The Rev. Hudson Stuck, D.D., lectured before the Society on Tuesday, December 9, on "The Conquest of Mt. McKinley," with lantern illustrations.

Lectures in January. On January 6, Albert Bushnell Hart, Ph.D., LL.D., Litt.D., Professor of Government in Harvard University, lectured before the Society at the Engineering Societies' Building on "The Balkans and Their Peoples," with lantern views.

The Annual Meeting of the Society will be held on January 20, 1914, at the Engineering Societies' Building. On that occasion Frederic Dean, A.M., LL.D., will give an illustrated lecture on "Porto Rico; Our West Indian Outpost."

The Society's House Open All the Year. Until last summer it was the practice to close the Society's house during August. The experiment of keeping the house open throughout the summer in 1913 was a success. It contributed to the convenience of the work in the building and maintained uninterrupted attention to the needs of geographical workers who have occasion to consult our literary or map collections. The public interest in this innovation was indicated by the fact that 290 persons visited the house in August last. The House Committee, at the November meeting of the Council, recommended that the precedent established last summer be continued hereafter.

Binding our Library Books. Some months ago 5,000 of our library books were sent out for binding. Of these, 3,400 have been returned and distributed to their proper places in the book stacks. The policy of binding all our library material excepting thin pamphlets, which are filed and indexed in pamphlet cases, conduces to convenience in handling the books and to their preservation.

Presented to the Society. A friend of the Society has presented two large framed maps now hanging on the wall in the Exhibition Hall. These are facsimiles of the Royal Spanish World Map about 1523 and the Sebastian Cabot World Map of 1544; also a picture woven in silk of the landing of Columbus, which is on the wall of the reading room.

Exhibition of the Society's Collection of Wall Maps, Atlases and Text Books. The collection was displayed in the rooms of the Rhode Island Normal School, Providence, R. I., during November. The maps were in place for the meetings of the Rhode Island Institute of Instruction and also for the Barnard Club, an organization of the men teachers of the state, and special effort was made to direct the attention of the latter body to the exhibit. Many visitors of standing in the community also went over the collection and expressed high appreciation of the efforts of the American Geographical Society to place this fine material before teachers. As an educative opportunity for the students of the Normal School, the display was well worth the effort, and results from it have already begun to appear.

The general tendency to publish maps of cheaper material without detracting from their effectiveness, and thereby make it possible for a school to select a large number of subjects is a noticeable advance in map work and was a distinguishing mark of the exhibit. The series of maps by Vidal de la Blache is a type of this new idea.

The following notes on the maps for the perusal of visitors helped them to consider the exhibits more intelligently:

NOTES ON WALL MAPS

1. A wall map should display its features in such a way that they can be seen from every part of the room.
   (*a*) A glazed surface, because of the different angles of reflection of light, does not permit of this.
   (*b*) Names in small type, especially if they appear in numbers, tend to confusion.

2. A physical wall map is more valuable than a political. For most countries, as Australia, the political wall map is of slight value.

3. A physical wall map should follow the rules generally accepted by geographers:
   (*a*) A universal color scheme. Lowlands in green, and highlands in brown. Two or more shades of brown may be used, the deeper for greater heights. An intermediate color, white, for uplands may be used.
   Water in blue, the deepest shades for the greatest depths. At least three shades are desirable, to show continental shelf, continental slope and ocean bottom.
   (*b*) The colors should have proper values so that the green or brown be not preeminent.
   (*c*) Localities may be indicated by a large dot or circle. The name may be indicated by the initial letter, a number or by very small type if it can be done without confusion.
   (*d*) Political divisions may be indicated on such maps by heavy (red) lines.

4. The newest idea is to have a single map for a single feature and new maps are being published at a small cost each with this end in view. Note the series by Vidal de la Blache and by Philips.

5. The Mercator Projection of the world which distorts area and shape is being gradually replaced by Mollweide's Homolographic (equal area) Projection which distorts shape only.

6. It is advisable in early grades to use a physical wall map only. Beginning about the sixth grade, the pupils may chart information on a map. With strong training on physical maps, using international colors, it will not be confusing at this stage if pupils color cotton areas, population areas, and the like.

NORTH AMERICA

Local Glaciation of the White Mountains. The Presidential Range of the White Mountains, according to J. W. Goldthwaite (*Appalachia*, XIII, No. 1), owes its most rugged forms to local glaciation before the coming of the general ice sheet. The local glaciers carved the cirques about the crest

that are now known as King's and Tuckerman's Ravines and the Bumpus Basin, among others, all typical, glacial cirques. Above these cirques the mountain forms are pretty much as they were before glacial time, the gentle slopes of a great monadnock above the peneplain of southern New England, which then stood much lower than now. Uplift caused the erosion of the deep normal gullies in which the local glaciers accumulated before the general glaciation. The great ice sheet left moderate but demonstrable effects—striation of ledges, moving of blocks, and especially the importation of ground moraine into the north facing cirques. The paper is admirably written and illustrated.

MARK JEFFERSON.

Rainfall Data for Botanists. The standard rainfall data usually included in climatological reports are often insufficient for botanists. Annual and monthly means of rainfall are all very well as far as they go, but they do not go far enough. It has been shown that the rainfall averaged by the crop year bears a much closer relation to the crop yield than does the average for the calendar year. And, twenty years ago, Dr. Gustavus Hinrichs showed, in his analysis of rainfall at Iowa City, how important it is, in correlating rainfall and crop yield, to consider the character of the rainfall, as well as the amount. The seasonal rainfall amounts are not usually included in climatological reports, yet these, rather than the annual and monthly amounts, are often the determining control of vegetation.

Dr. R. M. Harper, in a recent report on the Economic Botany of Alabama (*Geol. Survey, Ala., Monograph 8,* 1913), says that there is a general correspondence between hardwood forests and regions of heavy winter rains (Dec.-Feb.), and between the principal long-leaf pine area and heavy summer rains (June-Aug.). In another paper, entitled "A Botanical Cross Section of Northern Mississippi, with Notes on the Influence of Soil on Vegetation" (*Bull. Torrey Bot. Club,* Vol. 40, No. 8, 1913), Dr. Harper attributes the absence of certain bog plants from northern Mississippi to the seasonal distribution of rainfall there. Over the pine barren portions of the coastal plain the increased rainfall of summer largely counterbalances the higher evaporating power of the summer sun. Hence the water level is more uniform there, and conditions are favorable for the development of peat and of bog plants. Again, in a discussion of "The Forest Regions of Mississippi in Relation to the Lumber Industry" (*Southern Lumberman,* Nashville, Tenn., Aug., 1913), the same author points out that, while pines and evergreens are practically unknown in the northern half of the state, the south, where the summers are wetter, has a good deal of short leaf pine. These various references to the seasonal rainfall as a controlling factor in the distribution of vegetation indicate once more the need of attention on the part of climatologists to the requirements of their fellow-workers in other branches of science.

R. DEC. WARD.

Has Climate Changed in New Mexico? In a report upon "Climate and Evidence of Climatic Changes," forming part of an account of "The Physiography of the Rio Grande Valley, New Mexico, in Relation to Pueblo Culture" (*Bull. 54, Bureau of American Ethnology, 1913*), Messrs. Junius Henderson and Wilfred W. Robbins conclude that the various lines of evidence, botanical, archæological, historical, physiographical, which they have investigated point to a progressive desiccation of the region since the beginning of the pueblo and cliff-dwelling period. They find "no important evidence inconsistent with this view," but are careful to say that the change in population may possibly be ascribed to other causes. The authors believe that, if such desiccation has occurred, it was accompanied by numerous slight fluctuations in climate, and must have been "infinitely slow." The evidence of recent desiccation is not regarded as conclusive. Several suggestions are made for future work, and it is clear that the question of progressive climatic change is not regarded as settled.

R. DEC. WARD.

A Periodical Devoted to New Mexico. In July last the first number of a quarterly magazine entitled "Old Santa Fe, a Magazine of History, Archæology, Genealogy and Biography" was issued by the Old Santa Fe Press.

Its editor is Ralph Emerson Twitchell, whose work in two volumes "The Leading Facts of New Mexican History" was reviewed in the April and October numbers of the *Bulletin*. Associated with Mr. Twitchell are eight of the leading writers on those phases of New Mexico to which the magazine is devoted. The contents of the first two numbers give promise that the magazine will be a valuable record in this rich field for research. Among the works for publication is the Spanish manuscript collection of the Historical Society of New Mexico, translated and annotated.

The Prince of Monaco's Visit to This Country. Albert I, Prince of Monaco, the well-known oceanographer, spent a few weeks in this country in September and October. A dinner in his honor had been arranged by the American Geographical Society and the American Museum of Natural History, but owing to the inability of the Prince to reach New York from the Far West at the only convenient time, the projected dinner was reluctantly abandoned. A lecture by the Prince, under the auspices of the New York Academy of Sciences, was given at the American Museum of Natural History which kindly sent tickets to the Fellows of the American Geographical Society.

About 2,000 persons heard the lecture on Oct. 27. After referring briefly to the foundation of the Musée Océanographique in Paris and the publication of the Carte Générale Bathymétrique des Océans, the Prince devoted the greater part of the evening to a description of his numerous cruises and their results. With the aid of lantern slides and motion pictures he described the various observational methods employed by his staff (for a description see "L'Océanographie" by J. Richard, Paris, 1908, reviewed in the *Bull.*, Vol. 41, 1909, pp. 127-128). These included deep sea soundings, the determination of the physical properties of ocean water, color, salinity, temperature, density, etc., the charting of currents by means of objects set adrift, the investigation of the upper atmosphere by means of *ballons sondes* and, primarily, the study of the life of the ocean. The investigation of his staff in the latter domain, the Prince said, had led to various important discoveries. Among them was the fact that, contrary to former belief, organisms living at the greatest depths were capable of rising to the surface without harm, in spite of the great decrease in pressure. Such organisms had frequently been taken in dragnets on the surface at night. Referring to the wealth and variety of organisms disclosed in great depths the Prince expressed the belief that life on the earth had its origin in the depths of the sea and not on land.

The motion pictures gave a realistic idea of the various activities of an oceanographical cruise. Some showed how soundings are taken, some how dragnets and trawls are lowered and how their contents are examined after they have been raised again, some showed the release of balloons and box kites with meteorological apparatus for the observation of the upper air. The final motion picture, which dealt with a whale hunt, showed every stage of the chase from shooting the whale with a harpoon gun and hauling it on board by means of a winch to its dismemberment by the scientific staff, which included the opening of the stomach and the finding in it of valuable and unknown fish and other organisms.

SOUTH AMERICA

The Vegetation of Southernmost South America and the Sub-Antarctic Islands. On November 17, 1913, Dr. Carl Skottsberg, professor of botany at the University of Upsala, Sweden, lectured on this topic before the New York Academy of Sciences. He described the vegetation of the region of heavy rainfall on the west slope of the Andes from about lat. 41° to Cape Horn, the dry eastern slopes in the same latitude, the Falkland Islands, the island of South Georgia, and the edge of the Antarctic Continent. The Chilean forest is said to be the only cold-temperate rain-forest in the world. It is very dense, and the trees are mostly broadleaved evergreens. Among the mountains where the climate is a little drier a species of *Libocedrus* (a genus represented also in our Pacific Northwest) forms small groves which are the only analogue in the southern hemisphere of the great northern coniferous forests. The Patagonian side is mainly treeless, and the vegetation is characterized by grasses and a large number of plants which form dense tough

cushions, a type which is also frequent in New Zealand. The Falkland Islands are windy and treeless and covered with peat. Much damage has been done to the native vegetation by sheep in the last sixty years. South Georgia has snow most of the year, and only nineteen species of flowering plants. Bare rocks on the edge of the Antarctic Continent support two species of flowering plants and about fifty mosses. R. M. HARPER.

AFRICA

First Longitude Determination by Wireless in French West Africa. An account of the first wireless determination of longitude in French West Africa is given by Messrs. Schwartz and Villatte in *La Géographie* for Sept. 15, 1913 (Vol. 48, No. 3, pp. 137-146). The time observations were made at Konakry and Kissidugu. A mean difference of 14′ 22.79″ was determined between the two localities. The work was divided into three stages. The first consisted of astronomical observations taken at the two stations. This was followed by comparison of the Kissidugu chronometer and the Konakry electromagnetic clock by means of Hertzian signals sent from the last named place. A final set of astronomical observations was required to complete the task. The Kissidugu receiving station consisted of an antenna provided with 5 aerial wires, each 50 meters in length, for which 2 millimeter bronze telephone wires were used. This contrivance rested at one end on a mast-head 20 meters high and an 11-meter pole placed on top of a tree at the other. The antenna was connected with a receiver specially constructed to enable detection of the beats of the chronometer and the ticking of the sending station.

Agriculture in the Oases of Tripoli. Great effort is being made by the Italian government to promote agriculture in its newly acquired African colonies. According to the *Rivista Coloniale* for Sept. 15, 1913 (Vol. II, No. 5, p. 129), the colonial authorities have recently passed a decree by which owners of orchards in the oases of Tripoli, including the districts of Menscia, Zanzur and Tagiura, were summoned to re-occupy their lands before Sept. 30th, 1913. The government is anxious to insure abundant crop returns for the ensuing year and the decree stated that failure to comply with its provisions would result in the properties being farmed out. This, however, would be undertaken for the account of their owners.

Sahara Dust over the Atlantic. The portion of the Atlantic Ocean between the Canary and Cape Verde Islands was called *mare tenebrosum* by Edrisi in the twelfth century, because of the frequent darkening of the sky in that region by dust. The atmosphere was known to be so turbid at times as to make navigation by the vessels of those days dangerous. In the middle of the last century, Ehrenberg made a painstaking investigation of the origin of this dust, and published a series of papers on the subject in the *Mitteilungen* of the Berlin Akademie der Wissenschaften, in which he stated his belief in the South American origin of the dust. In 1878, Hellmann published an important paper (''Ueber die auf dem Atlantischen Ozean in der Höhe der Kapverdischen Inseln häufig vorkommenden Staubfälle,'' *Monatsber. Berl. Akad. Wiss.*, 1878, 364-403), in which the meteorological and geographical aspects of this phenomenon received special attention. Ehrenberg's view as to the non-African origin of the dust was there shown to be mistaken. Two of the points made by Ehrenberg against the African origin were (1) the fact that the Sahara sand is white, while the dust is really reddish; and (2) that the easterly winds necessary to carry this sand to the Atlantic are not present. These two points are now taken up by Hellmann in a recent paper (''Ueber die Herkunft der Staubfälle im 'Dunkelmeer,' '' *Sitzungsber. kgl. preuss. Akad. Wiss.*, XIV, 1913), and the most recent observations from the western Sahara are drawn upon for information. Hellmann clearly establishes the fact that the easterly winds which are necessary for the transportation of the dust to the Atlantic exist over the district in question, and, further, that there is an abundance of reddish sand over the inner portions of both the Saharan and Libyan deserts. Thus two of the remaining inaccuracies of Ehrenberg's discussion have been satisfactorily cleared up.

When meteorological conditions are favorable, the districts along the margins of the great deserts of the world very commonly receive large amounts of dust. Along the eastern coast of Asia the northwest winds of winter bring so much sand from the deserts and loess areas of the interior that these winds are called "yellow winds" over the lowland of Peking-Tientsin, and also quite generally in Mongolia. This dust is occasionally carried far out to sea.

R. DEC. WARD.

ASIA

The Service Géographique de l'Indo-Chine in 1912. Topographic work was undertaken between the Annam mountains and the Mekong lowland. Part of the region connecting Laos and the sea was surveyed for the first time. In Cambodia two field parties were at work gathering data for maps on a scale of 1:40,000 and 1:80,000. This work precedes more detailed surveys which will be made in connection with a proposed railroad to Sisophon. A field party was also at work in northern and southern Annam respectively. Mapping on a scale of 1:20,000 progressed along the deltas of the Phan-Thiêt and the Phan-Ri as well as in the Thanh-Hoa region. Two field parties in Laos completed the triangulation network for mapping, this year, on a scale of 1:80,000, the region which will be traversed by the railroad connecting Quang-Tri and Ka-Bai. A third party began preliminary geodetic work in the recently annexed province of Siem-Reap.

The work on hand in the cartographic department of the institution was varied. Six of the 1:25,000 sheets which were revised in 1911 were published. The Bac-Ninh sheet of the 1:100,000 general map was partially revised. Sheets of the environs of Hanoi and Saigon on a scale of 1:50,000 were published. In addition, maps were compiled for different government bureaus. Among the noteworthy sheets in this category are the geological map of Eastern Yunnan on a scale of 1:500,000 and various large scale plans for the use of the Artillery Corps.

The annual report published by the Service Géographique de l'Indo-Chine contains succinct topographic, geologic, ethnographic and economic descriptions relating to each sheet of the region surveyed in 1912.

A New Depression in Western Asia Attention is called in the *Zeitschrift der Gesellschaft für Erdkunde zu Berlin* (No. 8, 1913, p. 641) to a hitherto unknown depression in Mesopotamia, the bottom of which is occupied by a lake whose surface is about sixteen feet below sea-level. The sunken area is sixty-three miles northwest of Bagdad. It was discovered during the surveys by engineers of the Mesopotamian Irrigation Mission between 1909 and 1911. The leveling undertaken by this expedition has thrown considerable light on the topography of lower Mesopotamia. Unfortunately the presence of hostile Arabs near the lake prevented surveying from being extended around its entire periphery. Its eastern end alone could be determined through measurements, which, starting from near Saklawie, were carried northward to about ten miles west of Sabkha. According to a statement on Map No. 2 of "Plans of the Irrigation of Mesopotamia" by Sir Wm. Willcocks, it is believed that the depression is very long as the Tharthar River terminates at its northern end.

EUROPE

Depth of the Ejecta of the Eruption of Mt. Vesuvius in 1906. By means of photographs taken from the same spot in 1904 and 1913 Dr. P. Schlee in the October number of the *Geographische Zeitschrift* (Vol. 19, 1913, No. 10, pp. 577-578) calls attention to the filling up of the Atrio del Cavallo—the depression which lies on the inner side of the old crater rim of the Monte Somma, between it and the northern slopes of the new cinder cone of Mt. Vesuvius—by the ejecta of the volcano during the violent eruption of April, 1906. To the detritus normally brought down by the erosion of the new cinder cone was added the greater part of the lapillæ of this eruption, as these were projected in a northeasterly direction. The inner wall of the old crater rim, at the two points of which comparative photographs were taken, had a height, prior to the eruption of 1906, of 456 and 607 feet respectively, according to the official

map on the scale of 1:10,000 of the Italian Military Geographical Institute. To judge by the present position of the floor of the Atrio del Cavallo the wall at these two points is now approximately 325 feet and 500 feet high. The depth of the accumulations due to the eruption of 1906 would, therefore, be roughly 130 and 110 feet at these points. An additional criterion for the determination of this depth is afforded by comparing the recent detailed map of Mt. Vesuvius on the scale of 1:10,000 by A. Castiglione published in *Petermanns Mitteilungen* in November, 1912 (see *Bull.*, Vol. 45, 1913, p. 79, under "Italy" and p. 320 under *Erratum*), with the official Italian map just referred to. On Castiglione's map the floor of the Atrio is 100 feet and 80 feet higher respectively at the two points in question than prior to the eruption of 1906. Although Dr. Schnell considers these figures too small, he points out that accurate figures are of no consequence because the depth of the ejecta varies in different parts of the Atrio. They are sufficiently correct, however, to convey an impression of the amount of material thrown out by the eruption of 1906.

Cartographic Work of the Ordnance Survey during 1912-1913. The completion of all the field work for the survey of Ireland on a scale of 1:2,500 is announced in the Report of Progress of the Ordnance Survey for the year 1912-1913. Most of this survey has been published and it is expected that by the end of December, 1914, the whole will be available in printed form. At present all of the United Kingdom, with the exception of waste and mountainous areas, has been surveyed on this scale. This country is therefore the only one in the world "of which large scale cadastral maps are available for the whole cultivated or occupied surface."

Influence of the New Balkan Frontiers. Recent boundary adjustments in the Balkans are causing racial migrations. The movement is particularly noticeable along the Greco-Bulgarian frontier. This part of Macedonia was peopled by Greeks and Bulgarians before the war. The Greeks, however, were distributed mainly in the cities, while the Bulgarians represented the rural element in the population. These Bulgarian farmers and peasants are now leaving Greek territory and emigrating to the adjoining Bulgarian districts. On the other hand, the Greek merchants and traders of the Macedonian towns assigned to Bulgaria are leaving their homes to settle in the newly acquired Greek territory. A similar movement is taking place, though to a lesser degree, along the Greco-Servian boundary.

LEON DOMINIAN.

Navigational Exhibit of the Deutsche Seewarte. Under date of October, 1913, the Deutsche Seewarte of Hamburg announces that the collection of models, nautical instruments and drawings gathered by its first director, the late Dr. Neumayer, has again been placed on view. The collection is to be increased by a selection of nautical instruments, both those used in the merchant marine and in the navy, oceanographical and meteorological instruments. The collection will aim to be critical rather than comprehensive.

Le Congrès International d'Ethnologie et d'Ethnographie. The International Congress of Ethnology and Ethnography will meet at Neuchâtel, Switzerland, June 1-5, 1914.

POLAR

The Stefansson Expedition. A dispatch from Vilhjalmur Stefansson to the New York *Times* dated Point Barrow, Alaska, October 30, said that the *Karluk*, his largest vessel, beset in the ice, drifted towards the north past Point Barrow on August 8. On the same day, however, she got free of the ice, but was again beset in the heavy pack on August 12 about 15 miles off shore in long. 147° W. On August 17 she was free once more and drifted with the wind parallel with the coast till September 10. She stopped drifting in lat. 70° 47′ N. and long. 150°7′ W., not over 35 miles north of the Alaskan coast and about 140 miles south of east of Point Barrow, a little east of north of the mouth of the Colville River. Believing the *Karluk* was then fast in the ice for the winter Stefansson left the ship with Cook, Genness, Connell, Wilkins and two Eskimos to go ashore and secure a supply of fresh meat. He had two sleds and twelve dogs.

Two days later a northeast gale broke up the ice. There was a dense fog, and Stefansson says he does not know whether the ice carried the *Karluk* west or whether it freed her so that she could make progress to the east. At all events she should be safe as the wind opened the ice pack and the *Karluk* therefore was not under pressure. There were 25 persons including Captain Bartlett aboard the ship.

Stefansson proceeded to Point Barrow where he learned that his vessels *Alaska* and *Mary Sachs* were both safe and were wintering at Collinson Point. His steam whaling bark *Belvedere* was safe behind grounded ice three miles off shore near the 141st meridian. He expected to leave Point Barrow on November 3 and travel east along the coast. None of the plans of the expedition have been abandoned. They are merely delayed.

In a despatch Stefansson sent to the Canadian Government he says that he is planning an ice expedition to the Mackenzie Delta, making surveys and taking soundings for steamer routes. He thinks the *Karluk* has drifted west with the ice. There is no reason as yet to fear for the safety of the expedition or the ultimate carrying out of its plans. The *Karluk* is a seaworthy boat specially strengthened to resist ice pressure.

The 1913 Scientific Campaigns in Spitzbergen. During July and August of this year three parties were engaged in topographic, hydrographic, and geologic surveying. Investigations were confined to the district lying between Ice Fiord and Van Mijen Bay. According to C. Rabot, in *La Géographie* (Vol. 48, No. 3, Sept. 15, 1913, pp. 194-195), the 1:50,000 map of this peninsula was completed during this season. Attention has been called to this map in a recent number of the *Bulletin* (Vol. 45, No. 6, June, 1913, p. 450).

Hydrographic work included examination of the southern shores of Ice Fiord around Green Harbor and the determination of banks within a distance of 5 miles off shore along the western coast between the entrances to Ice Fiord and Bell Sound. One of these banks was discovered about four miles from land at a depth of two meters.

The region which is thus being investigated is the site of a settlement as far north as that occupied by the Eskimos at Etah, northwest Greenland. The discovery some twelve years ago of extensive coal beds in the vicinity of Advent Bay led to the founding of Longyear City on its shores. This mining camp is provided with a car-line and an electric plant. Its population consists of about 200 miners, the majority being Scandinavians.

Green Harbor is an important point in the whaling industry. Its commodious bay provides a favorable base for whaling boats. An oil plant is in operation in its vicinity. This outpost of civilization is connected by a wireless station with Scandinavia. LEON DOMINIAN.

The Magnetic South Pole. Recent wireless despatches from the Australian South Polar Expedition bring the news that the Magnetic South Pole has not yet been exactly located. The statement had been accepted that its position was determined in 1909 by Mr. David of the Shackleton Expedition. It appears, however, from recent investigations by Dr. Mawson that while David was really within the area where the magnetic needle from time to time assumes a vertical position, he was not in the center of this area, which is evidently much larger than has hitherto been supposed. There are probably several local poles distributed around the magnetic chief pole; and Dr. Mawson believes that he has been in the neighborhood of one of them in the southeastern part of Adelie Land. (*Zeitschr. Gesell. für Erdk. zu Berlin*, No. 7, 1913, p. 571).

OCEANOGRAPHY

A Proposed International Reconnaissance of the Atlantic Ocean. Messrs. O. Petersson and C. F. Drechsel, vice-president and general secretary of the *Conseil Permanent International pour l'Exploration de la Mer*, were intrusted with the task of drawing up a programme outlining the organization of an international survey of the Atlantic Ocean. A working plan prepared by them was, in September, 1913, issued as a Memorandum from Vol. XVI of the publications of the Permanent International Council. The writers say that a systematic hydrographical and biological investigation of the entire

Atlantic is a task too great to be now attempted. They therefore confined their attention to the part of the Atlantic beginning with the submarine zone of relief known as Telegraph Plateau, between lats. 50° and 55° N. and extending southward to lat. 10° N. As a north-and-south ridge divides the basin of the Atlantic into two great depressions in which hydrographical conditions differ it is advisable to survey each of these depressions independently. They suggest three lines of transatlantic investigations. The northernmost is across Telegraph Plateau between the Orkney Islands and the easternmost projection of the Newfoundland Bank. The depths here range between 1000 and 3000 meters, and the so-called Gulf Stream Drift would be traversed by the section.

Then two southern lines of survey are suggested for the investigation of the longitudinal deeps. The northernmost starts from the mouth of the English Channel and is directed north of the plateau of the Azores to the Caribbean Sea. The western deep is crossed diagonally by this section between latitudes 45° and 20° N. The taking of soundings of the Nares and Porto Rico Deeps is thus made possible. The other proposed route is between the Strait of Gibraltar and the island of Trinidad. This line, passing south of the Azores plateau, would permit observation of the eastern depression. The Moseley Deep, the central submarine ridge and the Sargasso Sea might then be investigated concurrently.

The investigation of coastal seas is also recommended. Ice conditions should be studied east and west of Greenland. A detailed survey of the northeastern Atlantic should be carried on from Iceland and the Faroe-Shetland ridge to Spitzbergen and Novaya Zemlya, including the North Sea, the Skagerak, the Kattegat and the Baltic. So far no hydrographical section through the Labrador Current has been obtained. The study of the waters on the Newfoundland Bank and adjacent areas is of special interest as it deals with the zone of conflict between the Gulf Stream and the Labrador Current.

It is suggested that cruises three months apart be made simultaneously in these various fields of observation so as to survey conditions existing throughout the whole year in the Atlantic Ocean. Practically all oceanographic investigations in the northern section of the Atlantic have been made during the summer or fall. A comprehensive view of conditions throughout the year must first be ascertained before direction can be given to more specialized researches.

So broad a programme can be carried out most profitably with the cooperation of the various governments whose citizens are interested in navigation and fishing in the regions examined. It is suggested that vessels sent to represent European governments at the inauguration of the Panama Canal in 1915 be equipped with all the apparatus needed to prepare hydrographical sections along their routes. These preliminary operations should be confined, in the opinion of Messrs. Petersson and Drechsel, to the zone between the surface and a depth of 1000 meters, in which food fishes and plankton thrive.

This subject has received attention at the meetings of the International Geographical Congresses. At London in 1895 and at Berlin in 1899 resolutions were passed recognizing the economic importance of oceanographical reconnaissances. At Geneva in 1908 a special commission bearing the title of "Commission internationale de l'Atlantique" was appointed, with H. S. H. Prince Albert of Monaco as its president. At the Tenth International Geographical Congress in Rome, 1913, a resolution was passed recommending preliminary exploration in the North Atlantic to throw light on the dimensions and nature of periodical variations of water layers found between the surface and a depth of 1000 meters. Temperature and salinity observations at the surface as well as more extended investigation of currents was also urged.

PERSONAL

Mr. N. H. Darton of the U. S. Geological Survey has recently returned to Washington after a long geological exploration in New Mexico.

An appropriation from the Shaler Memorial Fund of Harvard University has been granted to Professor W. M. Davis to defray, in part, the expense of his trip to the South Pacific to study the physiographic evidence relating to the problem of coral reefs.

Professor Julius Hann, the eminent climatologist of Vienna wishes to find

a purchaser for his meteorological library, which has accumulated on his hands far beyond his power to take care of it properly. Owing to the fact that he has to live on a pension, since he was retired from active government service and is obliged to live in small quarters, the greater part of his library is already packed away in boxes. His great collection of books and separates will be a fine addition to the library of any institution that desires to complete its collection of books bearing on meteorology and climatology. (*Science*, No. 987, Vol. 38, 1913, p. 768.)

Dr. H. R. Mill, director of the British Rainfall Organization, has been compelled to take a complete rest for a time on account of his eyes, which have been affected by the continual strain of his work. He will leave in November for a voyage to New Zealand, and is advised not to attempt to take up for at least a year any work which involves close attention. It is hoped that the rest and change will have a decidedly beneficial effect upon Dr. Mill's eyesight and general health. (*Nature*, No. 2296, Vol. 92, 1913, p. 272.)

OBITUARY

ALFRED RUSSEL WALLACE. This distinguished naturalist died in England on November 7, 1913, in his 91st year. For sixty-four years he had been in active service as scientific explorer, thinker and writer. In 1845 he invited Henry W. Bates, a fellow naturalist, to accompany him on his four years' journey to the Amazon and the Rio Negro (1848-1852). Bates, himself a naturalist of great ability, inspired Wallace with his own zest for searching out the wonders of insect life, a subject which Wallace finally made his own. His "Narrative of Travels on the Amazon" was published in 1853. Between 1854 and 1862 Wallace traveled in the eastern part of the Dutch East Indies. The vast array of facts he collected on the natives, forests, birds and mammals and the generalizations he evolved from his data given to the world in his "The Malay Archipelago" established his fame as a scientist of the first rank. Darwin and Wallace each worked out the problem of evolution independently and before Darwin had published his idea he received a long letter from Wallace telling of the same discovery as it had come to him. Sir Joseph Hooker and Prof. Lyell brought the two independent manuscripts together and there was thus a joint publication of the discovery.

Among Wallace's voluminous later writings the world was most attracted to "The Zoological Geography of the Malayan Archipelago" (1860) in which the author announced his discovery of the Bali-Lombok boundary line (now commonly known as the Wallace Line) between the Asian and the Australian zoological regions. "The Geological Distribution of Animals" (1876) and "Island Life" (1881) gave Wallace rank as the founder of the science of zoogeography; and in "Tropical Nature" (1878) he reviewed the whole subject of the colors of animals in relation to natural and sexual selection.

Wallace also took great interest in some phases of social and economic problems. Among his later essays were papers on "The Nationalization of Lands" and "Studies, Scientific and Social"; and his last published essay "Social Environment and Moral Progress" appeared in 1913.

RESOLUTIONS ADOPTED ON THE DEATH OF EX-COUNCILLOR HERMANN C. VON POST. At the meeting of the Council, on Nov. 20th, the following resolution relating to the death of Mr. Hermann C. von Post was adopted:

> "*Resolved:* That by the death of Mr. Hermann C. von Post on October 10, 1913, the Society has lost one of its oldest and most valued members. He became a Fellow of the Society in May, 1875, and in January, 1902, a member of the Council, from which he retired in December, 1910, because of advancing years, greatly to the regret of his colleagues. During his long period of service he was assiduous in his attention to the duties of Councillor. His great experience and excellent judgment made his advice most valuable; and his unfailing interest and loyal support were united with great liberality whenever assistance was needed. The zeal of the active workers in the Society was stimulated by the assurance of his cooperation at all times and his loss is felt by his fellow members as that of a long attached friend as well as colleague. We tender to his family our sincere sympathy in their affliction, and we direct the Secretary to forward to them a copy of this minute."

GEOGRAPHICAL LITERATURE AND MAPS

(INCLUDING ACCESSIONS TO THE LIBRARY)

BOOK REVIEWS AND NOTICES

(The size of books is given in inches to the nearest half inch)

NORTH AMERICA

Down the Mackenzie and up the Yukon in 1906. By Elihu Stewart. 270 pp. Map, ills. John Lane Co., New York, 1913. $1.50. 7½ x 5½.

Volumes continue to come from the press describing the wonders, the hazards and the beauties of northwestern North America. Some are worth while and some might better have been unwritten. This book belongs to the former class. It is a vivid description in simple but forceful style of Canada West. One does not feel exaggeration cropping out at any point in the discussion. On the other hand the reader can readily realize himself moving down the Mackenzie and up the Yukon encountering the same experiences, the same thrills met by the author.

The author visited this region as Superintendent of Forestry for Canada and bases his account upon his official report to the Canadian Government in 1906. However, technicalities are omitted except in Part II, where "a few brief general observations on certain characteristics and productions of the country" are discussed under 12 headings. An excellent map of Western Canada shows the route of the author. EUGENE VAN CLEEF.

The New Immigration. A Study of the Industrial and Social Life of Southeastern Europeans in America. By Peter Roberts. xxi and 386 pp. Index. The Macmillan Co., New York, 1912. $1.60. 8 x 5.

Immigration. A World Movement and Its American Significance. By Henry Pratt Fairchild. xi and 455 pp. Index. The Macmillan Co., New York, 1913. $1.75. 8 x 5½.

During the first seven months of 1913 over 750,000 immigrants arrived in this country and the high-water mark of 1,285,349 in 1907 may be exceeded when the record for the year is computed. Most of these new comers settle in the northeastern United States. While many of the foreigners may be poorly prepared to adapt themselves to conditions of living here, it is likewise true that our nation is not accepting all the opportunities and duties which this influx of people begets. These two books, much alike in their purpose but different in treatment, present the problems of immigration. Dr. Roberts's book is an inductive study, and he has collected many facts touching every phase of immigration, including the home leaving, the journey, arrival, conditions of work, of home, of societies, church and politics and the problems of assimilation from which the reader may derive his own conclusions. The author is a firm believer in immigration.

The book by Fairchild is a sociological study. The coming of many Europeans to America is treated as a phase of the movements of peoples throughout the history of the human race; and after a discussion of the present stage, which is not essentially different from the treatment by Roberts, the author presents a concise and scholarly summary of the nature of the problem. It seems almost self-evident that the people among whom the immigrant settles should be most interested to understand the new neighbors. Unfortunately this is not the case, largely perhaps because of the lack of opportunity; but this want is now filled by the admirable presentation of this live question in these two volumes. ROBERT M. BROWN.

Bewölkungsverhältnisse und Sonnenscheindauer von Nordamerika. Von Arthur Gläser. 63 pp. Diagrams. *Archiv der Deutschen Seewarte*, Vol. 35, 1912, No. 1. Hamburg, 1912. Mk. 4.50. 12 x 9½.

Teisserenc de Bort (1884), Greely (1891) and K. McR. Clark (1911) studied and charted the cloudiness of the United States. In two cases (Greely and Clark) we have had monthly as well as annual isonephs. Now comes a new publication by Arthur Gläser, prepared as an "Inaugural-Dissertation" at the University of Leipzig, in which we have by far the most complete discussion of the cloudiness and sunshine of North America which has yet been attempted. All available material has been drawn upon; the data have been subjected to critical comparison, and an unusually large number of charts and diagrams has been prepared. Thus, under cloudiness, we have charts showing the monthly, seasonal and annual isonephs; annual variation; seasons of maximum and minimum cloudiness, and diagrams of isopleths for longitudes 80°, 90°, 100° and 110° west, and latitudes 32°, 40° and 47° north, as well as for the west and east coasts. The accompanying discussion is unusually complete, and takes up the causes of the variations in cloudiness, as well as the facts of variation. Our only comment on these excellent charts would be that it might perhaps have been wiser to omit a good many of the local isonephs in cases where the area concerned is small. Recorded amounts of cloudiness depend to so considerable an extent upon the personal equation of the observers, and the possibility of drawing these local isonephs is determined in so many cases by the fact that there happens to be a station in that particular locality, that to include the smaller details seems to us to give a less accurate rather than a clearer and more accurate view of the actual distribution of cloudiness.

Sunshine in North America has received even less attention in the past than cloudiness, for the reason, doubtless, that the data are far less complete, and are also more recent. Van Bebber's chart (1896) is well known because of its having been included in Bartholomew's *Atlas of Meteorology*. Dr. Gläser has given us charts showing the mean hourly duration of sunshine for each month and for the year; monthly isohels (per cent.) and the annual variation in these percentages; seasons of maximum and minimum cloudiness; mean duration of sunshine in hours of the day for each month; daily march of sunshine for summer, winter and the year, and still other charts. In addition, diagrams showing the distribution of sunshine, by means of isopleths, for the same latitudes and longitudes as in the case of cloudiness, are included.

The mere enumeration of these various charts and diagrams will serve to indicate the thoroughness with which the whole investigation has been carried out. Dr. Gläser has made one of the notable contributions to American climatology.

R. DeC. WARD.

An Illustrated Flora of the Northern United States, Canada and the British Possessions from Newfoundland to the Parallel of the Southern Boundary of Virginia, and from the Atlantic Ocean Westward to the 102d Meridian. By Nathaniel L. Britton and Addison Brown. 2nd edition, revised and enlarged. Vol. 1: Ferns to Buckwheat. xxix and 680 pp. Vol. 2: Amaranth to Polypremum. iv and 735 pp. Vol. 3: Gentian to Thistle. 637 pp. Index. Ills. in each. Charles Scribner's Sons, New York, 1913. 11 x 7½.

Students of American plant geography, as well as other groups of botanical workers, will find the new edition of this well-known work very valuable, even indispensable in many cases. To the phytogeographer and the plant ecologist the book is especially well suited, serving them as a highly authoritative index and catalogue of the plant forms with which they have to deal. By the aid of line drawings which accompany each species description, the labor of plant identification is very greatly reduced, thus allowing the results of special taxonomic study to be employed with considerable readiness by non-taxonomic workers. This feature of the work before us has already proved itself in the first edition.

The geographical area embraced by this descriptive catalogue of native and naturalized ferns and seed-plants is given in the title. The whole of Nebraska is included. The notes upon distribution, however, frequently refer

to geographic limits beyond those mentioned. These notes, while appearing very vague and unsatisfactory to the student of vegetational distribution, are doubtless about as definite as the present status of knowledge will permit, and such students will be thankful for what is given.

The information upon habitats is not by any means so pleasing as that concerning geographical ranges. It is a remarkable fact that little if any improvement in the characterization of plant habitats in such books as this seems to have been attempted for many decades, and no attempt in this direction is here evident. Habitat conditions are frequently not mentioned at all, and where they do find place the terms employed are usually very indefinite and carry but little meaning; it appears that these habitat notes have been allowed to find their way into the work without critical attention. Thus, the thirteen species of *Sparganium* here dealt with apparently occur in eleven different categories of habitats, the latter being described as follows: "In marshes and along streams," "in bogs and shallow water," "in low grounds or ponds," "in ponds and streams" (three species so noted), "in lakes and streams," "in marshes and rivers," "in bogs," "in swamps and on muddy shores," "in ponds and marshes," "in slow streams and ponds," and "in ponds and cold lakes." For another illustration of the prevalent futility of these habitat notes, out of the twenty-five species of *Quercus* that are listed six are given without any intimation of the sort of habitats in which they are to be found, six others are said to occur "in dry soil," and the remaining thirteen occur:—"in moist ground"; "in clayey soils"; on "borders of swamps and streams"; "in sandy or rocky soil"; "along streams and swamps"; "in swamps and along streams"; "in rich soil"; "in moist or swampy soil"; "in moist soil"; "in dry soil, preferring limestone ridges"; and "in dry sandy or rocky soil." Such examples as these lead the student of plant distribution to an appreciation of the almost untouched newness of his field of work and to the conviction that the whole problem of the relation of plant form to environmental conditions remains to be explored. Considering the historical development and present nature of botanical science, these remarks are not to be taken as adverse criticism of a work written by taxonomists for taxonomists; nevertheless the question may be logical and permissible, *if* habitats are to receive attention at all in such a work as this, then why not strive to have these notes at least logically clear and perhaps as definite as present knowledge will allow? To the general student of plant phenomena it may appear that habitat characters are as interesting and important as are the conventional morphological descriptions of the plants themselves. It may be hoped that with the appearance of a third edition of this important work (and there will assuredly be a third edition), the ecological view-point may have become general enough so that the present naive and often well-nigh meaningless habitat descriptions may be displaced by others more worthy of the name of science.

As to the plant names employed in the "Flora," there are probably many who will still prefer to cling, in numerous instances, to binomials other than the ones here set down. The writers have followed the "American code" of nomenclature, but the once strange and fearsome workings of this code have already become familiar to at least the younger generation of American botanists. What may be the outcome of the persistent disagreement among taxonomists, in regard to nomenclatorial codes, may not yet be prophesied, but there can be little doubt that the success which has been achieved by the "Illustrated Flora" in its first edition and the further impetus now given by the second edition, will render a possible displacement of the binomials here employed a very slow and arduous process,—if, indeed, such displacement be destined ever to occur. The patent fact seems to be that there are now simultaneously prevalent at least two different binomials for each of a large group of American plants; of these names the botanical writer is free to take his choice. An author's name appended to the binomial always makes it clear, however, so that the condition of affairs here is not nearly so serious as is sometimes supposed. It may be hoped, nevertheless, that taxonomists may agree to employ but a single binomial for each recognized plant species sometime before the world adopts a universal language. Students of plants will

probably realize sooner or later that nomenclature is not in any true sense an end in itself, but is merely a more or less conventional tool for expressing important relations. Britton and Brown's work makes such a position easy, for these authors are careful to give synonyms wherever needed.

Numerous changes have been made from the first edition, some of them minor, some of them farther reaching. The whole number of species included has been increased from 4,162 to 4,666, and the number of recognized genera is now 1,229 instead of 1,103 as in the first edition. There now appear 194 families instead of 177. The genus "*Crataegus*" has grown remarkably during the last decade; the first edition of the "Flora" recognized but fifteen species while the present edition includes seventy-three.

The excellence of typography and of mechanical and æsthetic features, which characterized the earlier volumes, has been retained in the books before us. It is safe to predict that the new "Flora" will find a place on the shelves of every botanical library. B. E. LIVINGSTON.

The Coming Mexico. By Joseph King Goodrich. The World To-Day Series. xii and 280 pp. Ills., index. A. C. McClurg & Co., Chicago, 1913. $1.50. 7½ x 5.

The author has the advantage of having known Mexico since 1866. Scenery, prehistoric civilization, social and economic phenomena are considered as well as the country's resources and the prospects of their development. Such a wide field cannot of course be adequately covered within the space of a single volume. Nevertheless the work will be instructive to those who have never traveled south of the Rio Grande. Optimistic views regarding the Republic's future are presented. LEON DOMINIAN.

The Viceroy of New Spain. By Donald E. Smith. *Univ. of California Publications in History,* Vol. 1, 1913, No. 2, pp. 99-293. Berkeley, Cal. $2. 10 x 6½.

This publication is specifically historical. It is an honest, liberal and impartial effort, fair to Spanish matters and utterly free from the invective and vituperation commonly poured out upon them by writers of other nations. The sources at the command of the author are comparatively limited and he is conscious of it, but what he had he has used conscientiously and with unusual fairness. AD. F. BANDELIER.

Bermuda, Past and Present. A Descriptive and Historical Account of the Somers Islands. By Walter Brownell Hayward. xii and 239 pp. Ills., index. Dodd, Mead & Co., New York, 1912. $1.25. 8 x 5½.

From the tourist's point of view this is, on the whole, the most helpful book on Bermuda. It does not supplant such a work as Verrill's but it is handy to carry and its information has been carefully compiled. It includes an account of the history of Bermuda as well as an adequate description of the wonderful charm and comfort that of late years have drawn to this dotlet in the ocean from 15,000 to 27,000 visitors a year. Unfortunately some popular books sold to tourists as guide books, while containing much helpful information, are marred by many trivialities and inaccuracies.

Why a mere mention in Mr. Hayward's book of the "Boilers or Coral Atolls"? A good picture of them is given. They are peculiar to Bermuda, their process of development is well known and it would interest any intelligent person to be told something of the origin of this remarkable feature of the south coast.

CENTRAL AMERICA AND WEST INDIES

La Immigración Italiana y la Colonización en Cuba. Por F. F. Falco. 96 pp. Index. Soc. Tipogr.-Editrice Nazionale, Turin, 1912. 9½ x 6½.

While Dr. Falco's report deals mainly with Italian emigration to Cuba, its value as a contribution to the problem of Italian emigration entitles it to wider consideration. Ample evidence of the author's twenty years' investigation of

the subject is revealed by the thoroughness of his compilation. After reviewing the causes and different phases of this Italian movement the writer examines the various methods which might tend to create a current of immigration towards Italy. He evidently does not view with favor the activity displayed by steamship and railroad companies in fostering such movements. It must be acknowledged, nevertheless, that the incentive to increase passenger traffic by transportation companies has been of itself an exceedingly potent factor in the creation and growth of modern emigration currents. LEON DOMINIAN.

The Story of Panama: The New Route to India. By Frank A. Gause and Charles Carl Carr. xii and 290 pp. Map, ills., index. Silver, Burdett & Co., New York, 1912. $1.50. 8½ x 6.

The Panama Canal. By Duncan E. McKinlay. 40 pp. Ills. Whitaker & Ray-Wiggin Co., San Francisco, 1912. 75 cents. 8½ x 6.

The Panama Canal. Pictorial View of the World's Greatest Engineering Feat, Linking the Atlantic and Pacific Oceans. With a Brief History and Description of the Gigantic Undertaking. By Thomas H. Russell. 25 pp. Ills. Hamming Publishing Co., Chicago, 1913. 60 cents. 6 x 8.

The completion of the Panama Canal provides the occasion for books with variety of appeal according as the probable interest of one class of reader may vary from that of another class and according as one aspect or the other of the great work has attracted the writer. Here we group three works of different types, necessarily somewhat overlapping.

The little volume by Dr. Russell is pictorial, almost panoramic in the selection of illustrations which may carry the reader from Colon over the Culebra height to Panama. The few pages of text are designed to be no more than introduction and brief commentary upon the work shown in the pictures.

Congressman McKinlay saw at the Isthmus those aspects of the canal which had been the subject of debate in the Capitol and at the Executive Departments. His record deals with legislation, with treaty rights, with canal type and above all with the condition of law which it was necessary for the Canal Commission to establish.

The work of Gause and Carr is more ambitious in tone. It aims to present a standard history of the canal from its inception to its completion. Ancillary thereto they have dealt with the history of the Isthmus from Balboa to the Republic of Panama. WILLIAM CHURCHILL.

SOUTH AMERICA

Aborigines of South America. By the late Colonel George Earl Church. Edited by Clements R. Markham. xxiv and 314 pp. Map, index. Chapman & Hall, Ltd., London, 1912. 10s. 6d. 9 x 6.

The present work could have no better review than that contained in the preface by the editor, Sir Clements R. Markham, himself an eminent authority on the geography and tribal settlements of South America. In it he speaks with appreciation of the extent of Col. Church's knowledge of his subject and of the value of his observations and deductions, lamenting the untimely death which left the volume unfinished.

In the introduction the author briefly sketches the early physical features of South America and their relation to the aborigines, showing that vast inland seas first divided the continent into two great divisions, the Brazilian and Andean, and then by their gradual desiccation left stretches of forest and an intricate network of waterways which became the inaccessible refuge and home of savage tribes. From what source these earliest races came Col. Church does not even conjecture, but contents himself with saying that the habitable areas were probably well populated at a period coeval with the Pliocene and mammalia of which remains are found in great abundance in southeastern Bolivia, the Argentine, and Brazil. He then discusses the trend of migration and the habits and customs of the aborigines, but admits the diffi-

culty of obtaining data because of the conditions to which they have been forced to submit since the conquest.

Chapters I and II deal with the Caraios and the Tapuyas, the tradition being that the latter were the earlier race who had once held the Atlantic Coast line from the Rio de la Plata to the Amazon, and who were conquered and partly dispossessed by the invading Caraios. These two races still differ widely in respect of physique, habits, ceremonies, language and stage of civilization, the Tapuyas being pure nomads and the Caraios showing a high degree of agricultural skill and some well organized tribal cohesion.

The remainder of the volume is devoted to a brief but clear emuneration of the other races which came under Col. Church's observation. Omitting minor tribes they are the peoples of Southwestern Amazonia, of Lowland Amazonia and of the eastern slope of the Andes; and the Chiriguanos and the Abipones.

Barring the somewhat categorical effect which is imposed by the nature of the subject matter, the style is charming and the book full of personal touches which easily explain the friendly relations Col. Church was able to establish with these half-savage tribes. ELLEN S. OGDEN.

AFRICA

Periplo dell'Africa. Del Capitano E. A. d'Albertis. vii and 572 pp. Maps, ills., index. Fratelli Treves, Milan, 1910. 10 x 6½.

The sixteenth travel book which Captain d'Albertis has written. His works are in the best class of popular travel narratives. He is always the keen observer, eagerly seeking facts and accurately and entertainingly recording them. His latest journey included the circumnavigation of Africa with an ascent of the Nile (Cairo-Khartum, describing also an earlier journey, Khartum-Port Sudan), a cross-country trip (Beira-Rhodesia-Transvaal-Cape Town), many ports in east Africa and St. Helena and the Canary Islands on the homeward journey. The whole book is profitable reading, and some of the chapters, as those on Rhodesia, the Transvaal and the Cape of Good Hope, are especially informing. The 540 photographs add largely to the value of the work.

Les Nègres d'Afrique (Géographie Humaine). Par Cyr. Van Overbergh. Collection de monographies éthnographiques. xii and 276 pp. Albert Dewit, Brussels, 1913. 10 x 7.

This volume contains the introductory chapters written for each of ten monographs now before the public which treat of ten great African tribes, the Bangala, Mayombe, Basonge, Mangbetu, Warega, Kuku, Ababua, Mandja, Baholoholo and Baluba, all living in the Belgian Congo excepting the Kuku (Anglo-Egyptian Sudan) and the Mandja (French Equatorial Africa). These studies were made on a uniform plan approved by the International Congress at Mons in 1905 and based upon 202 sub-topics arranged for systematic treatment. The monographs were written by Mr. Cyr. Van Overbergh, President of the International Bureau of Ethnology, assisted by workers in the various fields. The introductory chapters giving a general summing up of the environment and the characteristics of each tribe are full of condensed information. The price per volume is 10 francs; and to subscribers to the entire collection, 7.50 francs. Other volumes are in press.

GENERAL

La Côte d'Ivoire Chrétienne. Par R. P. J. Gorju. iv and 219 pp. Map. ills. Soc. Missions Africaines de Lyon, 1912. Fr. 4. 10 x 6½.

This book is written by a member of the missionary staff of the Ivory Coast and it is to a large degree a history of the mission from the time of its establishment in 1895. A single chapter is devoted to the country and its inhabitants, and although it is brief the main points of the physiography of the country are clearly outlined and a few of the customs of the natives, especially such as would seem reprehensible, are mentioned. The greater part of the book is a recital of arrivals and departures of missionaries, the founding

of new mission stations and the various problems of the work. Enough of the contact with the people and the struggle with the unusual conditions is written into the history to yield a knowledge of the geography of the country. The fight with yellow fever was severe, and nearly every chapter chronicles the death of a member of the devoted band. In reality the book is a memorial to the large number of missionaries who in a brief period lost their lives in this inhospitable land. ROBERT M. BROWN.

ASIA

Über die geographische Verbreitung und die Formen der Altertümer in der Nordwestmongolei. Von J. G. Granö. 55 pp. Reprint, *Journ. Soc. Finno-Ougrienne*, Vol. 28. Helsingfors, 1910. Fmk. 2.

The author has recognized that for a region so well explored as this border land of Mongolia at the meeting of forest and desert the mere listing of archæological finds has little value. He prefers to discuss such material under the topics of site, such as grave mounds, and graves marked on the surface by parallelogrammatic stone enclosures, such as stone wallings and pillars. To these considerations of site he adds notes upon graphic art and inscriptions. Then in wider survey he traces the geographical extent of the several types of remains and differentiates therein the nomadic peoples whose support is in their herds and the agricultural people for whom fixity of habitation is beginning.

Die Provinz Yünnan, ihre Handels- und Verkehrsverhältnisse. Von F. Weiss. Reprint, *Mitt. Seminars für Orient. Sprachen zu Berlin*, Vol. 15, Abt. 1: Ostasiatische Studien. 1912.

This most western province of China proper, almost unknown twelve years ago, has been coming into light through the French railroad to the city of Yunnan, the French and British railroad surveys with incidental studies of population and resources and the work of several other explorers. This book is a good summary of the information collected by some though not all of the sources upon which our knowledge now depends, including the annual and decennial reports of the Chinese Customs Service. The material is logically arranged, compactly treated and is for the present the most complete and convenient source of reference as to the geography, population, resources, industries, communications and commerce of Yunnan.

Chinesische Geschichte. Von Dr. Heinrich Hermann. 519 pp. Index. D. Gundert, Stuttgart, 1912. Mk. 10. 10 x 6½.

There are rich possibilities in the promise of modesty when the student prefaces his work with the simple statement "I am no historian, but an acquaintance with Chinese history struck me as essential to my duty in a mission high school." Historians of China there have been none. Histories of China have been many. The difficulty has lain in the fact that to comprehend the logical sequence in the chronological sequence of events of enormous ages in the Middle Kingdom it is necessary to have familiarity with the working of the Chinese mind in a psychology whose postulates are alien to our thought. The willow pattern plate exhibits in its single disk the whole difference between Orient and Occident. To Chinese taste that design tells clearly and perfectly a simple and pleasing tale; to us the story is almost undecipherable because it lacks the particular quality of perspective which we have learned to expect and which we, quite forgetting that its acquisition is a matter of but the most recent centuries of our art life, have come to regard as an immutable datum of nature. Thus we find in our libraries many histories of China and not a single history. The critic may not venture to contravene the modest preface of Dr. Hermann. We may not assert against his denial that this Chinese history is really a History of China. But it comes very close to that success. It is well balanced in all its parts, its narrative is clear and comprehensible, its philosophy is brilliantly explicative in exhibiting to our untrained minds the logic of Chinese thought in the causation of successive and dependent events. Our at-

titude toward this culture persisting in steady and consistent growth from the antiquity of human society is tiresome even to ourselves, to the Chinese literati it is childish. How old is our logic? St. Thomas Aquinas was contemporary with Kublai Khan, and China had prospered for nineteen whole dynasties before that time. When our new learning acquired the gift of inductive logic the Ming dynasty had run half its span. China has many treatises of its own on Chinese history. The only difficulty has been that we either cannot or will not comprehend it. I regard this work as far in advance of former Caucasian histories of China in the particular that it is rich in the interpretation of Chinese history in terms of our thought and therefore is comprehensible.

WILLIAM CHURCHILL.

Men and Manners of Modern China. By J. Macgowan. 351 pp. Ills., index. Dodd, Mead & Co., New York, 1912. $3.50. 9 x 6.

This is one of the volumes which the political change in the Middle Kingdom has suggested, by no means the least considerable of a rapidly growing library of sinology. All but a few of its chapters have found publication as historical essays in the *North China Herald* and have already been published in China in a collected volume. This more definite presentation is a new and enlarged edition of a work which took its true form at a period preceding the recent discharge of the Manchu from imperial rule, while the revision has afforded opportunity for the inclusion of recent events.

Mr. Macgowan has been devoted to Chinese affairs for a half century. In eastern Asia he has long been commonly bracketed with Sir Robert Hart for intimate familiarity with the Chinese character. We may therefore accept his conclusions with full confidence and thus find in them a safe approach to the comprehension of a social complex which is in general quite as difficult of study as it is worthy of understanding. Upon one point of particular application to this new China these interesting chapters will shed light, namely, the depth of the revolution. We may think that a desire for freedom is instinct within the mass of the Chinese people and that an outraged race has arisen in its might to shake off the oppressor. This volume will make it clear that there is no such thing as a Chinese race capable of united action for the betterment of its own condition, that conditions vary from province to province or other governmental administrative unit, and that the revolution is so superficial that not in long years will the basic Chinese even know that it has taken place.

WILLIAM CHURCHILL.

A Summer Ride Through Western Tibet. By Jane E. Duncan. 316 pp. Ills., index. W. Collins, London, 1913 (?). 1s. 6 x 4.

The instructive story of a woman's journey along the upper Indus valley. A clear picture of the region is given and the customs and industries of the mountain population are described. The route extended from Srinagar to Leh and down the Indus to the Vale of Kashmir; but from the main route many side trips were taken so that the book is a reconnaisance of the mountain district north of the Sind valley in India. As the journey was taken leisurely, Miss Duncan has been able to picture some phases of Tibetan life which escape the more hurried traveler. A few good maps would add to the value of the book.

ROBERT M. BROWN.

GENERAL

Changes in Bodily Form of Descendants of Immigrants. (Final Report). Prepared by Franz Boas. xii and 573 pp. Reports of the Immigration Commission. 61st Congress, 2d Session, Senate Document No. 208. Washington, 1911. 9½ x 6.

This work at its first appearance attracted great attention among anthropologists. It is in that branch of science that the work may properly be discussed and an estimate be made of the validity of its conclusions. It suffices to say here that the author has been most diligent in accumulating data and ingenious in presenting the record in such manner as to facilitate study. The present edition, somewhat enlarged by additional detail, is printed as a Senate document at the request of the Immigration Commission.

Missionslose Länder. Ungelöste Missionsaufgaben. Von D. S. M. Zwemer. Berechtigte Übersetzung aus dem Englischen von Luise Öhler mit einem Vorwort vom D. Jul. Richter. Handbücher zur Missionskunde, 5. Band. 227 pp. Maps, ills. Basler Missionsbuchhandl., Basel, 1912. 60 cents. 7½ x 5.

One of the results of the world's missionary conference held in Edinburgh in 1910 has been the compilation of a series of mission texts in which are summed up the results hitherto scattered through a vast file of sectarian journals. The purpose of this library is to further the efficiency of mission work by the production of professional papers wherein the beginner may study the methods which have been found most effective by his predecessors in the field. Of the German series Handbücher zur Missionskunde, this forms the fifth volume. Dr. Samuel Zwemer is well known for his evangelical work among the Mohammedans. This volume points out the new fields for missionary endeavor. From the figures which he presents it is seen that the mission field must long remain a large one, for Christianity has spread in name, even if no more, to but one-third of the population of the earth.

OTHER BOOKS RECEIVED

These notes do not preclude more extended reference later

NORTH AMERICA

Color Key to North American Birds. By Frank M. Chapman. With upward of 800 drawings by C. A. Reed. Revised edition. x and 356 pp. Bibliogr., index. D. Appleton & Co., New York, 1912. $2.50. 9 x 6. [A standard work of reference for easy identification of birds.]

Fruit-Farming on the "Dry Belt" of British Columbia. The Why and Wherefore. By J. S. Redmayne. 132 pp. Map, ills. The Times Book Club, London, 1912. 2s 6d. 11 x 9.

(*a*) Land, Fisheries and Game, Minerals. 1911. 519 pp. Maps, ills., index. (*b*) Long Sault Rapids, St. Lawrence River. An Enquiry into the Constitutional and Other Aspects of the Project to Develop Power Therefrom. By Arthur V. White. 384 pp. Maps, ills., index. 1913. (*c*) Fur-Farming in Canada. By J. Walter Jones. viii and 166 pp. Maps, ills., index. 1913. (*d*) Sea-Fisheries of Eastern Canada. Proceedings of the Committee on Fisheries, Game and Fur-Bearing Animals of the Commission of Conservation, Ottawa, June 4-5, 1912. 212 pp. Ills., index. Commission of Conservation, Canada. Ottawa. 10 x 7 each. [Admirably compiled reports helpful to those engaged in the development of resources and industries.]

Second Annual Report [of the Commission of Conservation, Canada] Including a Report of the Proceedings of the Second Annual Meeting, Quebec, Jan. 17-20, 1911, and of the Dominion Public Health Conference, Ottawa, Oct. 12-13, 1910. vii and 230 pp. Index. Report of 3d Annual Meeting, Ottawa, Jan. 16, 1912. vi and 154 pp. Maps, ills., index. Report of 4th Annual Meeting, Ottawa, Jan. 21-22, 1913. 238 pp. Maps, ills., index. Commission of Conservation, Canada, Ottawa. 10 x 7 each. [A wide range of economic data on Canada's natural resources.]

Water-Powers of Canada. By Leo G. Denis and Arthur V. White. 397 pp. Maps, ills., index, and maps in separate case. Commission of Conservation, Canada. Ottawa, 1911. [A thorough treatment of the subject.]

The Heart of Gaspé. Sketches in the Gulf of St. Lawrence. By John Mason Clarke. xiv and 292 pp. Map, ills. The Macmillan Co., New York, 1913. $2. 8 x 5½. [A charming and informing book by the State Geologist of New York.]

AFRICA

TAGEBUCHBLÄTTER AUS NORDAFRIKA. Von Anna Tittmann-Sulzberger. 116 pp. Schulthess & Co., Zürich, 1912. Mk. 1.80. 7½ x 5.

AU COEUR DU MAROC. Par Louis Botte. 2nd ed. Collection des Voyages Illustrés. 227 pp. Map, ills. Hachette et Cie, Paris, 1913. Fr. 4. 7½ x 5.

LA SOCIÉTÉ MAROCAINE. Études Sociales, Impressions et Souvenirs. Par Dr. Mauran. Avec une lettre-préface de M. Le Général d'Amade. 299 pp. Ills. Henry Paulin et Cie, Paris, 1912 (?). Fr. 5. 10 x 6½. [Observations on customs and mode of life.]

DANS NOTRE EMPIRE NOIR. Par Maurice Rondet-Saint. vii and 237 pp. Map. Plon-Nourrit et Cie, Paris, 1912. 7½ x 4½. [A narrative of personal experiences.]

DER KONGOSTAAT LEOPOLDS II. Von Max Büchler. 1. Teil. Schilderung seiner Entstehung und seiner wirtschaftlichen Verhältnisse. viii and 235 pp. Rascher & Cie, Zürich & Leipzig, 1912. 8½ x 5½. [Deals with the beginnings of the colony and tells how the late King Leopold became interested in Central Africa.]

SUL D'ANGOLA. Relatorio de um governo de distrito (1908-1910). By João de Almeida. xix and 606 pp. Maps, ills. Ministry of Colonies, Lisbon, 1912. [Physiographical, ethnographical and historical notes precede the account of Portuguese occupation and administration.]

ASIA

PAYSAGES D'ASIE. Sibérie-Chine-Ceylan. Par Henry Asselin. 2nd ed. 234 pp. Hachette et Cie, Paris, 1911. Fr. 3.50. 7½ x 5.

IL MILIONE. Secondo il Testo della "Crusca." Reintegrato con gli altri Codici Italiani. Di Marco Polo. A cura di Dante Olvieri. 317 pp. G. Laterza & Figli. Bari. 1913. L. 5.50. 8½ x 5½. [Based on a collation of the "ottimo" edition of Marco Polo with Tuscan and Venetian versions instead of the original French.]

THE CALL OF THE SNOWY HISPAR. By Fanny Bullock Workman and William Hunter Workman. Map, ills. 1913. 9½ x 6½. [A fine set of photogravures accompanied by short descriptive notes. The large number of views portray the elevated region in much detail.]

MES TROIS ANS D'ANNAM. Par Gabrielle M. Vassal. Préface de M. le Dr. Roux. viii and 303 pp. Map, ills. Hachette et Cie, Paris, 1912. 7½ x 5. [Much information on the customs of the Moi tribes.]

EUROPE

ROYAL CASTLES OF ENGLAND. Comprising an account of those ancient fortresses which from the days of William the Conqueror either were the homes of English sovereigns or have been intimately associated with the history and romance of their lives. By Henry C. Shelley. xii and 349 pp. Ills., index. L. C. Page & Co., Boston, 1913. $3. 8½ x 6.

THE GOVERNMENT OF ENGLAND. By A. Lawrence Lowell. New edition, with additional chapter. Vol. 1: xvii and 584 pp. Vol. 2: viii and 563 pp. Index. The Macmillan Co., New York, 1912. $4. 2 vols. 9 x 6½ each. [Instructive historical records and political discussions.]

DAS RUSSISCHE REICH IN EUROPA UND ASIEN. Ein Handbuch über seine wirtschaftlichen Verhältnisse. Herausgegeben von A. von Boustedt und D. Trietsch. 2nd ed. 508 pp. Börsen & Finanzliteratur, Berlin, 1913. Mk. 8. 9½ x 8. [Excellent handbook of commercial and economic information.]

DIE NIEDERELBE. Von Richard Linde. Land und Leute, Monographien zur Erdkunde, No. 28. 202 pp. Map, ills., index. Velhagen & Klasing, Bielefeld & Leipzig, 1913. Mk. 4. 10 x 7. [One of the excellent regional descriptions which these publishers issue. Splendidly illustrated.]

VOYAGE DU CARDINAL D'ARAGON EN ALLEMAGNE, HOLLANDE, BELGIQUE, FRANCE ET ITALIE (1517-1518). Par Don Antonio de Beatis. Traduit de l'Italien d'après un manuscript du seizième siècle. Avec une introduction et des notes par Madeleine Harvard de la Montagne. Préface de Henry Cochin. xxx and 327 pp. Ills., index. Perrin et Cie, Paris, 1913. Fr. 5. 8 x 5½. [Scenes and customs sketched by an alert observer. They afford an excellent picture of conditions prevailing at the time. Explanatory notes accompany the text.]

WAS MAN FÜR EINE SCHWEIZER-REISE WISSEN MUSS. Anhaltspunkte für Reiselust und Kulturinteressen. Von Josefine Mann. 139 pp. Ills., index. O. Füssli, Zürich, 1913. 7 x 5. [Practical suggestions and information for the tourist.]

THE SCENERY OF SWITZERLAND AND THE CAUSES TO WHICH IT IS DUE. By The Right Hon. Lord Avebury. 4th ed. xxxv and 489 pp. Maps, ills., index. Macmillan & Co., London, 1906. $1.50. 8 x 5½. [A new edition of this standard work.]

THE MAKING OF THE BALKAN STATES. By William Smith Murray. 199 pp. Map. *Studies in History, Economics and Public Law*, Vol. 39, No. 1. Columbia University, New York, 1910. $1.50. 10 x 6½. [Review of events that led to political disturbances in the Balkans. Considerable light thrown on the causes of recent boundary modifications.]

LA VIVANTE ROUMANIE. Par Paul Labbé. Collection des Voyages Illustrés. 202 pp. Map, ills. Hachette et Cie, Paris, 1913. Fr. 4. 7½ x 5. [The latest of the excellent popular works of this well-known traveler.]

MATHEMATICAL GEOGRAPHY AND CARTOGRAPHY

MILITARY TOPOGRAPHY FOR THE MOBILE FORCES, INCLUDING MAP READING, SURVEYING AND SKETCHING. By Captain C. O. Sherrill. 3d ed. xviii and 353 pp. Maps, diagrams, index. U. S. Cavalry Association, Ft. Leavenworth, Kansas. $2.50. 9 x 5½.

PHYSICAL GEOGRAPHY

FESTLÄNDER UND MEERE IM WECHSEL DER ZEITEN. Von Wilhelm Bölsche. 103 pp. Maps, ills., index. Franckh'sche Verlagshandlung, Stuttgart, 1913. Mk. 1. 8 x 5½. [The evolution of continental land-masses simply described.]

ANTHROPOGEOGRAPHY

JENSEITS DER HOCHKULTUR. Ein Beitrag zur Wertschätzung der Menscheit. Von A. Sokolowsky. 84 pp. Ills. Deutsche Verlagsgesellschaft, Hamburg, 1912. Mk. 3. 9 x 6. [Essays on the development of culture under varied surroundings.]

METHODOLOGY AND TEACHING

PHILIPS' GEO-GRAPH BOOK. A Geographical Observation Note Book for Climatic, Astronomical and Other Records. By J. H. Hack. Part 1. 32 pp. G. Philip & Son, Ltd., London, 1913. 3d. 10 x 8. [A set of blank diagrams and charts for filling out.]

DEDUCTIVE EXERCISES IN GEOGRAPHY: Europe. By Cyril R. Dudley. 62 pp. Maps. George Philip & Son, Ltd., London, 1913. 1s. 8½ x 6½.

GENERAL

COMMON SENSE IN FOREIGN POLICY. By Sir Harry Johnston. x and 119 pp. Maps. Smith, Elder & Co., London, 1913. 2s 6d. 9 x 5½. [The relations between Great Britain and foreign countries are discussed, including the commercial factors involved. Text and maps set forth the author's views on the future orientation of world-politics.]

ROBERT FULTON, ENGINEER AND ARTIST. HIS LIFE AND WORKS. By H. W. Dickinson. xiv and 333 pp. Ills., index. John Lane Co., New York, 1913. $3. 9 x 6. [Based on documentary evidence sought in England, France and the United States. The story of the introduction of steam navigation in the Western Hemisphere.]

L'AVIATION. Par Paul Painlevé, Émile Borel, Ch. Maurain. Nouvelle collection scientifique. 6th ed. viii and 298 pp. Ills. Félix Alcan, Paris, 1913. Fr. 3.50. 7½ x 5.

THE FEDERAL SYSTEMS OF THE UNITED STATES AND THE BRITISH EMPIRE, Their Origin, Nature and Development. By Arthur P. Poley. viii and 453 pp. Index. Pitman & Sons, Ltd., London, 1913. Little, Brown & Co., New York. 12s 6d. 8½ x 5½.

TEXT-BOOK OF ZOOLOGY. By H. G. Wells and A. M. Davies. 6th ed. Revised by J. T. Cunningham. viii and 487 pp. Ills., index. University Tutorial Press, London, 1913. 6s 6d. 7 x 5.

LIFE AND ADVENTURES OF AUDUBON, THE NATURALIST. By Robert Buchanan. Series: Everyman's Library. xx and 335 pp. Index. E. P. Dutton & Co., New York, 1913 (?). 35 cents. 7 x 4½. [An excellent biography of the noted American ornithologist.]

WHO'S WHO IN SCIENCE. International. 1913. Edited by H. H. Stephenson. 571 pp. Index. J. & A. Churchill, London, 1913. 8s. 9 x 6.

CURRENT GEOGRAPHICAL PAPERS

NORTH AMERICA

United States. BECKIT, H. O. The United States National Parks. (American Transcontinental Excursion of 1912, II). Maps, ills. *Geogr. Journ.*, Vol. 42, 1913, No. 4, pp. 333-342.

BROWN, C. S. The Petrified Forest of Mississippi. Ills. *Pop. Sci. Monthly*, Vol. 83, 1913, No. 5, pp. 466-470.

CHISHOLM, G. G. Economic Aspects. (American Transcontinental Excursion of 1912, I). Map, ill. *Geogr. Journ.*, Vol. 42, 1913, No. 4, pp. 322-333.

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CLAPP, F. G. Outline of the Geology of Natural Gas in the United States. Diagrams. *Econ. Geol.*, Vol. 8, 1913, No. 6, pp. 517-542.

DARTON, N. H. Buried Valley of Susquehanna River in Luzerne County, Pa. *Journ. of Geol.*, Vol. 21, 1913, No. 6, pp. 556-563.

HANN, J. v. Zur Meteorologie der zentralen Region des Felsengebirges von Colorado. Nach A. J. Henry. *Meteorol. Zeitschr.*, No. 7, 1913, pp. 330-340.

HARPER, R. M. The Forest Resources of Alabama. Map, ills. *Amer. Forestry*, Vol. 19, 1913, No. 10, pp. 657-670.

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HOLMES, J. S. Forest Fires in North Carolina during 1912, and National and Association Cooperative Fire Control. 63 pp. *North Carolina Geol. & Econ. Surv. Econ. Paper 33.* 1913.

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MOFFIT, F. H. Geology of the Nome and Grand Central Quadrangles, Alaska. 140 pp. Maps, ills., index. *U. S. Geol. Surv. Bull. 533.* 1913.

O'DONNELL, G. Bibliography of [the state of] Washington: Geology and Geography. 63 pp. Index. *Washington Geol. Surv. Bull. No. 12.* 1913.

OGILVIE, A. G. Impressions of the Vegetation in the United States of America. (American Transcontinental Excursion of 1912, III). Ills. *Geogr. Journ.*, Vol. 42, 1913, No. 4, pp. 342-360.

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—— Decisions of the U. S. Geographic Board, Oct. 1, 1913. 2 pp.

—— Lower Devonian. 560 pp. Maps, ills., index. Middle and Upper Devonian. 720 pp. Maps, ills., index. Vol. of plates, 156 pp. [Form part of a series of reports dealing with the systematic geology and paleontology of Maryland.] Maryland Geological Survey, Baltimore, 1913.

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U. S. COAST AND GEODETIC SURVEY*

Alaska. Western Part [of] Prince William Sound, South Coast [of] Alaska. 1:80,000. 60°53′ - 60°21′ N.; 148°16′ - 146°5′ W. 1 color. Chart No. 8517. May 1913. Price 50 cents.

Maryland. (a) Chesapeake Bay: Sandy Point to Head of Bay. 1:80,000. 39°36.5′ - 39°0.9′ N.; 76°39.6′ - 75°47.0′ W. Chart No. 1226. June 1913. 50 cts.

(b) Chesapeake Bay: Cove Point to Sandy Point. 1:80,000. 39°2′ - 38°22′ N.; 76°35′ - 75°48′ W. 1 color. Chart No. 1225. June 1913. 50 cts.

[Charts Nos. 1226 and 1225 cover the same territory as former Charts Nos. 136 and 135.]

Maryland-Virginia. Chesapeake Bay: Smith Point to Cove Point. 1:80,000. 38°24′ - 37°52′ N.; 76°29′ - 75°34′ W. 1 color. Chart No. 1224. July 1913. 50 cts.

[Covers the same territory as former Chart No. 134, which it replaces.]

New York. Shinnecock Light to Fire Island Light, [Long Island]. 1:80,000. 40°56′ - 40°23′ N.; 73°14′ - 72°14′ W. 1 color. Chart No. 1214. August 1913. 50 cts.

[Covers part of the territory shown on Charts Nos. 118 and 119 on the same scale.]

New York-New Jersey. Kill Van Kull. 1:15,000. 40°39.6′ - 40°36.9′ N.; 74°12.2′ - 74°3.8′ W. 1 color. Chart No. 544. 30 cts.

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* Only new charts are listed, not new editions of old charts.

North Carolina. (a) Albemarle Sound. 1:80,000. 36°23′ - 35°50′ N.; 76°47′ - 75°52′ W. 1 color. With inset: Continuation of Alligator River. 1:80,000. 35°50.5′ - 35°37.8′ N.; 76°8.2′ - 75°58.5′ W. 1 color. Chart No. 1228. May 1913. 50 cts.

(b) Currituck Beach to New Inlet. 1:80,000. 36°23.0′ - 35°33.5′ N.; 75°59′ - 75°17′ W. 1 color. Chart No. 1229. June 1913. 50 cts.

Oregon–Washington. (a) Columbia River: St. Helens to Willamette River, including Vancouver and Portland. 1:40,000. 45°51.8′ - 45°29.8′ N.; 122°53.9′ - 122°38.3′ W. Chart No. 6154. May 1913. 25 cts.

(b) Columbia River: Harrington Point to Grims Island. 1:40,000. 46°20.0′ - 46°5.4′ N.; 123°40.6′ - 123°7.8′ W. Chart No. 6152. July 1913. 25 cts.

[Chart No. 6154 covers the same territory as old Chart No. 6145 and part of No. 6144; Chart No. 6152 covers the same territory as old Chart No. 6142 and part of No. 6141.]

Pennsylvania–New Jersey–Delaware. Delaware River: Wilmington to Philadelphia. 1:40,000. 39°59′ - 39°42′ N.; 75°32′ - 75°2′ W. 1 color. With inset: Philadelphia to Trenton. 1:80,000. 40°13′ - 39°59′ N.; 75°5′ - 74°40′ W. 1 color. Chart No. 295. July 1913. 50 cts.

[Covers almost the same territory as old Chart No. 126, on twice as large a scale, however.]

Philippine Islands. (a) Tablas Island and Vicinity. [1:100,000]. 12°44′ - 11°53′ N.; 121°44′ - 122°22′ E. 1 color. Chart No. 4410. June 1913. 40 cts.

[Relief in contours; interval 100 ft.]

(b) Western Masbate. [1:100,000]. 12°43′ - 11°50′ N.; 122°50′ - 123°31′ E. 1 color. Chart No. 4412. May 1913. 40 cts.

(c) Southwestern Negros. [1:100,000]. 9°30′ - 8°55′ N.; 122°18′ - 123°5′ E. 1 color. Chart No. 4432. August 1913. 40 cts.

(d) Harbors on Dinagat, Siargao and Bucas Islands. [Seven maps:] (1) Dapa Channel, South Coast of Siargao Island. 9°48′ - 9°40′ N.; 125°57.4′ - 126°6.0′ E. 1 color. (2) Dinagat, West Coast of Dinagat Island. 1:20,000. 9°58′ N. and 125°36′ E. 1 color. (3) Sohutan Bay and Inlet, Southwest Coast of Bucas Grande I. 1:20,000. 9°36′ N. and 125°55′ E. 1 color. (4) San Roque, West Coast of Dinagat Island. 1:25,000. 10°6′ N. and 125°29′ E. 1 color. (5) Port Pilar, East Coast of Siargao Island. 1:30,000. 9°52′ N. and 126°7′ E. 1 color. (6) Gaas Bay and Inlet, East Coast of Dinagat Island. 1:30,000. 10°12.7′ - 10°8.0′ N.; 125°33.8′ - 125°41.8′ E. 1 color. (7) Malinao Inlet, East Coast of Dinagat Island. 1:25,000. 10°17.4′ - 10°13.5′ N.; 125°35.3′ - 125°40.8′ E. Chart No. 4638. August 1913. 30 cts.

CENTRAL AMERICA AND WEST INDIES

Central America. Einige Vulkangebiete Zentralamerikas. Entworfen von Dr. Karl Sapper.

(a) [Six detailed maps, 1:100,000:] 1a. Vulkänchen westlich vom Güija-See in ihrer ungefähren Lage nach den unkorrigierten Itinerarlinien, 1895 und 1897. 1b (1a and 1b together form one map). Die Vulkänchen der Ebene von Jutiapa nach Itineraraufnahmen, 1892 und 1897. [14°40′ - 14°15′ N.; 90°10′ - 89°40′ W.]. 3 colors. 2. Die Lage der freien Lavaströme von El Tambor und Antobran. Itineraraufnahmen, 1889. [15°5′ N. and 89°45′ W.]. 1 color. 3. Die Lage des freien Lavastroms El Florido (Guatemala). Itineraraufnahmen, 1889 u. 92. [15° N. and 90¼° W.]. 1 color. 4. Ungefähre Lage der Vulkänchen östlich vom Ayarza See. Itineraraufnahmen 1892 u. 1897. [14⅓° N. and 90°5′ W.]. 3 colors. 5. Umgebung des Chingo und Viboras. Itineraraufnahmen, 1892 und 1897. [14°5′ N. and 89°45′ W.]. 3 colors. 6. Skizze der Umgebung von Cuajiniquilapa. Itineraraufnahmen, 1892 und 1897. [14°15′ N. and 90°15′ W.]. 3 colors.

(b) Übersicht. 1:7,500,000. 17° - 7° N.; 94° - 77° W. 3 colors.

Accompany "Die mittelamerikanischen Vulkane" by K. Sapper, *Ergänzungsheft zu Petermanns Mitt. Nr. 178*, 1913.

[Maps under (a) maps of minor groups of volcanoes, in southeastern Guatemala and northwestern Salvador. Map (b) an extract from sheets 92 and 93

of Stieler's Atlas showing the location of the detailed maps. On it maps 5 and 6 have inadvertently been transposed. The lack, in so authoritative a treatise, of a large-scale general map showing the relationship of the various groups of volcanoes to each other is disappointing.]

AFRICA

Eritrea. [Four maps, by M. Checchi, G. Giardi and A. Mori, on the scale of 1:1,500,000, bounded by 18°17′ - 12°0′ N. and 35°40′ - 43°27′ E., entitled:] (1) Carta della Zone Climatiche e delle Piogge nella Colonia Eritrea. Anno 1912. 8 colors. (2) Densità della Popolazione nella Colonia Eritrea. Anno 1912. 12 colors. (3) Distribuzione della Ricchezza in Bestiame nelle varie Regioni della Colonia Eritrea. Anno 1912. (4) Distribuzione del Bestiame nelle varie Regioni della Colonia Eritrea. Anno 1912. Accompany *Rivista Coloniale*, Vol. 8, 1913, Part I, No. 5, and Part II, Nos. 2, 3 and 6, respectively, map (1) illustrating "Brevi Notizie sulle Zone Climatiche nella Colonia Eritrea" by G. Dainelli and O. Marinelli, Vol. 8, Part I, No. 5, pp. 157-161.

[Valuable maps on a relatively large scale representing various phases of the geography of Eritrea and, in some cases, of northern Abyssinia. Map (1) distinguishes five climatic zones, based mainly on altitude and seasonal distribution of rainfall. Eight rainfall densities are shown; also mean annual temperatures of certain places. Map (2) differentiates between degrees of density of native population and indicates, by means of six symbols, how many Europeans reside in the various towns. Maps (3) and (4) relate to domestic animals, the former representing their value per square kilometer and per inhabitant, the latter showing the number per square kilometer of cattle, camels, horses, and sheep. The maps, which are all official and were previously published by the Direzioni Centrale degli Affari Coloniali of the Ministero degli Affari Esteri—newly created into an independent department under the name of Ministero delle Colonie—are good examples of modern Italian enterprise in colonial geography.]

German East Africa. (a) Hans Meyer's Ostafrika-Expedition 1911: Übersichtskarte, mit Eintragung der Vegetations-formationen auf Grund der Engler'schen Vegetationskarte von Deutsch-Ostafrika, abgeändert nach eigenen Beobachtungen von Hans Meyer. 1:5,000,000. 0° - 12½° S.; 29° - 40⅔° E. 13 colors. With inset: Geologische Übersicht der Reiseroute im Zwischenseengebiet und bis Tabora von Dr. Schlossmacher. 1:5,000,000. 1° - 5° S.; 29° - 33⅓° E. 7 colors.

(b) Hans Meyer's Ostafrika-Expedition 1911, Blatt 1: Ihángiro und der Burigi-See. Nach den Routen u. Messtischaufnahmen von Oberleutnant Tiller und mit Benutzung der Skizzen und Beobachtungen von Prof. Dr. Hans Meyer und allen älteren Materials unter Leitung von P. Sprigade u. M. Moisel konstruiert u. gezeichnet von F. Schröder. 1:300,000. 1°18′ - 2°22′ S.; 31°5′ - 32°0′ E. 5 colors.

(c) Hans Meyer's Ostafrika-Expedition 1911, Blatt 2: Die Muwissi-Berge und das westliche Randgebirge von Ruanda und Urundi. Nach den Aufnahmen von Oberleutnant Tiller und mit Benutzung der Skizzen und Beobachtungen von Prof. Dr. Hans Meyer und allen älteren Materials unter Leitung von P. Sprigade u. M. Moisel konstruiert u. gezeichnet von W. Rux. 1:300,000. 2°30′ - 3°36′ S.; 29°3′ - 30°0′ E. 4 colors.

(d) Hans Meyer's Ostafrika-Expedition 1911, Blatt 3: Süd-Ussagara. Nach den Routen u. Messtischaufnahmen von Oberleutnant Tiller und mit Benutzung allen älteren Materials unter Leitung von P. Sprigade u. M. Moisel konstruiert u. gezeichnet von F. Schröder. 1:300,000. 6°20′ - 7°30′ S.; 36°0′ - 37°0′ E. 2 colors. With inset: Vegetations-Karte von Süd-Ussagara. Von Dr. R. Houy. 1:900,000. 6°20′ - 7°30′ S.; 36°16′ - 37°0′ E. 4 colors.

(e) Der Kihonde-See in Südost-Ruanda. 1:300,000. [20°3′ S. and 30°50′ E.]

(f) Karte der Vulkane Niragongo und Namlagira. Ausschnitt der Originalkarte von Oberleutn. Weiss (1:100,000) mit Eintragung einiger neueren Höhenzahlen nach den Aufnahmen der Deutsch-Belgischen Grenzkommission. 1°23′ - 1°42′ S.; 29°7′ - 29°21′ E.

Accompany, maps (a) to (d) as "Übersichtskarte" and Karten 1, 2, and 3, respectively, in pocket, maps (e) and (f) on pp. 25 and 29, respectively,

"Ergebnisse einer Reise durch das Zwischenseengebiet Ostafrikas, 1911" by H. Meyer, *Ergänzungsheft Nr. 6 der Mitt. aus den Deutschen Schutzgeb.*, 1913.

[Maps incorporating some of the results of Dr. Hans Meyer's expedition of 1911, mainly to the region lying between Lakes Victoria and Kivu. Map (a) is a general map showing Dr. Meyer's route to this region, which led by the British East Africa railroad from Mombasa to Port Florence, thence by boat on Lake Victoria to Bukoba; the return was effected by the German East African railroad from Tabora to Dar-es-salam. On this map, besides, the plant formations are shown in the region traversed. The symbol for Dr. Meyer's route is shown in so faint a red that it is almost illegible in the northwestern corner of German East Africa because of the superposition of red ruling to indicate a plant formation. The route in this region may be followed in the inset, however, where it is shown in black.

Maps (b), (c) and (d) are important large-scale maps which constitute original contributions of the expedition to the mapping of the regions concerned. Map (b) covers the region immediately to the west of the southwestern corner of Lake Victoria, map (c) the region lying to the northeast of the northern end of Lake Tanganyika, comprising parts of Ruanda and Urundi. On all three maps all previous information has been added, so that they represent our present state of knowledge with regard to these regions. Relief is shown in approximate contours in brown, the author's route in red.

Map (d) is a text map of a small lake discovered by the expedition lying just west of the Kagera River in 2° S. lat. Map (e) is also a text map showing some of the volcanoes belonging to the Virunga group which was the special field of exploration of the Duke of Mecklenburg's expedition (see also maps listed under "German and British East Africa-Belgian Congo" in *Bull.* Vol. 43, 1911, p. 956 and under "Uganda-Belgian Congo-German East Africa" in Vol. 45, 1913, p. 877).]

ASIA

Turkey in Asia. La Syrie en 1912: Carte Administrative (Chemins de fer. Routes carrossables. Pistes principales). [1:3,000,000]. [37⅔° - 31° N.; 34° - 38⅔° E. Accompanies, as Pl. IX on p. 445, "Notes sur la Syrie (2e Partie)" by De Torcy, *La Géogr.*, Vol. 27, 1913, No. 6, pp. 429-458.

[Shows railroads in operation and projected, roads suited to wheeled traffic, and principal routes. Cf. also map listed under same heading in the *Bull.*, Vol. 45, 1913, No. 9, p. 718.]

AUSTRALASIA AND OCEANIA

Bismarck Archipelago. Sprachenkarte von Neu-Mecklenburg u. den Nachbargebieten. Entworfen von Dr. Georg Friederici. 1910. 1:1,000,000. 1° - 5° S.; 149° - 155° E. 12 colors. Accompanies "Wissenschaftliche Ergebnisse einer amtlichen Forschungsreise nach dem Bismarck-Archipel im Jahre 1908, II: Beiträge zur Völker- und Sprachenkunde von Deutsch-Neuguinea" by G. Friederici, *Ergänzungsheft Nr. 5 der Mitt. aus den Deutschen Schutzgeb.*, 1912.

EUROPE

Germany. (Höhenschichtenkarte des Grossherzogtums Hessen, 1:25,000). [7 sheets, in 2 to 3 colors (the first number refers to the position of the sheet in the Hessian, the second to its position in the Prussian scheme, as explained in the comment below), viz:] (1) Hess. No. 15, Pr. No. 3166: Blatt Giessen. 1908. 50°36′ - 50°30′ N.; 8°40′ - 8°50′ E. (2) Hess. No. 22, Pr. No. 3223: Blatt Hungen. 1911. 50°30′ - 50°24′ N.; 8°50′ [incorrectly given in the S. W. corner as 20°30′ E. of Ferro] - 8°60′ E. (3) Hess. No. 39, Pr. No. 3407: Blatt Kastel. 2nd edition, revised, 1910. 50°6′ - 50°0′ N.; 8°10′ - 8°20′ E. Hess. No. 46, Pr. No. 3438: Blatt Mainz. 2nd edition, revised, 1910. 50°0′ - 49°54′ N.; 8°10′ - 8°20′ E. (5) Hess. No. 56, Pr. No. 3467: Blatt Darmstadt. 2nd edition, revised, 1910. 49°54′ - 49°48′ N.; 8°30′ - 8°40′ E. (6) [Hess. No. 72, Pr. No. 3505:] Blatt Lindenfels. 1893 - 98. 49°42′ - 49°36′ N.; 8°40′ -

8°50′ E. (7) [Hess. No. 75, Pr. No. 3518:] Blatt Viernheim. 1899-1900. 49°36′ - 49°30′ N.; 8°30′ - 8°40′ E. Published by the Grossherzogl. Hessisches Katasteramt, and sold at M. 2. a sheet by the Grossherzogl. Staatsverlag, Darmstadt.

[Seven sheets of the topographical map of Hesse. It was begun in 1886 and is to comprise 80 sheets, of which about 66 have been published (see the index map listed under "Germany," second entry, in the *Bull.*, Vol. 44, 1912, p. 239). The limits of the sheets coincide, in principle, with those of the "Messtischblätter" on the same scale published by the Kgl. Preussische Landesaufnahme, with which sheets it bears great resemblance (for index map of the Prussian sheets see under "Germany," third entry, *loc. cit.*). Due to the lack of connection, at the beginning of the undertaking, between the Hessian and the Prussian triangulation systems, the earlier sheets of Upper Hesse do not coincide completely with the corresponding Prussian sheets. The discrepancy is indicated on the relevant sheets. In execution the sheets reflect the high standard maintained by the German government surveys: relief is in brown contours (interval 10 meters), drainage in blue, other features, including woods, in black. On map (4), which includes the southern part of the city of Mainz, proposed streets are shown in red.]

POLAR

Spitzbergen. (a) Übersichtskarte von Spitzbergen zur Veranschaulichung des Verlaufs der Expedition Schröder-Stranz und der Hilfsexpeditionen zu deren Rettung. Mercator's projection; scale in 80° N., 1:1,000,000. 80°50′ - 76°0′ N.; 9°10′ - 30°20′ E. 4 colors.

(b) Routenkarte der Hilfsexpedition des deutschen Observatoriums am Ebeltofts-Hafen zur Rettung der Mitglieder der Schröder-Stranz-Expedition, Mai 1913. Entworfen von Dr. Kurt Wegener. 1:250,000. 80°5′ - 78°43′ N.; 11°0′ - 17°30′ E. 4 colors.

Accompany, as Taf. 29 and 28, respectively, "Die Deutsche wissenschaftliche Station auf Spitzbergen und die Schröder-Stranz-Expedition" by H. Hergesell and K. Wegener, *Petermanns Mitt.*, Vol. 59, II, 1913, Sept., pp. 137-140.

[Map (a) a general large-scale map showing in red the routes of the various relief expeditions. Aside from its immediate purpose the fact that this map embodies all previous knowledge of the topography of the interior of Spitzbergen makes it valuable as a general reference map. Map (b) is a large-scale detailed map of West Spitzbergen between Ice Fiord and Wijde Bay, embodying new surveys in the interior made by Dr. Wegener on the relief expedition which he conducted. The route lay from King's Bay over the inland ice to the head of Wood Bay, then around the peninsula of Andree Land to West Fiord on the west shore of the upper end of Wijde Bay, and thence west back across the inland ice to King's Bay. On both maps relief is in brown, drainage and glaciers are in blue.]

WORLD AND LARGER PARTS

East Indies and Australasia. Übersichts-Skizze Indonesisch-Melanesischer Wanderzüge, von Dr. G. Friederici. 1:15,000,000. 12½° N. - 30° S.; 114° - 170° E. 5 colors. Accompanies "Wissenschaftliche Ergebnisse einer amtlichen Forschungsreise nach dem Bismarck-Archipel im Jahre 1908, III: Untersuchungen über eine melanesische Wanderstrasse" by G. Friederici, *Ergänzungsheft Nr. 7 der Mitt. aus den Deutschen Schutzgeb.*, 1913.

[Shows probable routes of migration of races which at present inhabit certain parts of Melanesia. Two routes are shown: (1) that of the Alfuro migration, from Ceram and the southern Moluccas along the north coast of New Guinea to Astrolabe Bay (146° E.), whence three branches diverge, one to the north coast of Neu Pommern (New Britain) and to Neu Mecklenburg (New Ireland), the second around the southeastern peninsula of New Guinea nearly to the Gulf of Papua, and the third via the Solomon Islands to the New Hebrides; (2) that of the Philippine or sub-Philippine migration, from

Palawan and the northeastern tip of Celebes along the north of New Guinea and the Bismarck Archipelago and skirting the outer side of the Solomon Islands to the New Hebrides. An extended review of the monograph which the map accompanies was published in the *Bull.*, Vol. 45, 1913, pp. 859-860.]

Other Maps Received

AFRICA

Morocco. Plano del Campo Exterior de Melilla y Croquis del Campo Fronterizo. 1:10,000. Depósito de la Guerra. [Madrid]. 1909.

Mapa de la Parte Norte de Marruecos. 1:500,000. 2 sheets. Depósito de la Guerra [Madrid].

Portuguese East Africa. Plano hydrographico do Rio Bons Signaes (Quelimane). 1:40,000. Commisão de Cartographia. Ministerio da Marina e Ultramar. [Lisbon]. 1910.

Portuguese West Africa. Plano Hydrographico da Bahia do Lobito. 1:10,000. Commisão de Cartographia, Ministerio da Marina e Ultramar. [Lisbon]. 1910.

ASIA

Burma. Burma, Rangoon Harbour. Sheet No. 1. 1:12,102. Deputy Conservator of the Port. [Rangoon, Burma.] 1912.

India. Carte de l'Inde Ecclésiastique. 1:4,400,000. Les Missions Catholiques. [Lyon].

The Motor Union Insurance Map of India. Sheets: North, and South. 1:2,027,520. G. W. Bacon & Co., Ltd., London, [1913].

Near East. [Map of the Near East]. 1:6,019,200 or 95.6 miles to 1 inch. With inset: Palestine. 1:685,000. G. W. Bacon & Co., Ltd., London, [1913].

EUROPE

Austria. Handkarte des Politischen Bezirkes Korneuburg. 1:150,000. G. Freytag & Berndt, Wien, 1913. 30 Heller.

Plan der k. k. Reichshaupt- und Residenzstadt Wien, herausgegeben unter Mitwirkung des Wiener Stadtbauamtes. Gezeichnet von Karl Loos. 1:25,000. R. Lechner (Wilh. Müller) k. u. k. Hof- u. Univ.-Buchhandlung, Wien, 1912.

Plan der k. k. Reichshaupt- und Residenzstadt Wien. Herausgegeben unter Mitwirkung des Stadtbauamtes. 1:20,000. Verlag von Gerlach & Wiedling, Wien. [1913].

Plan der k. k. Reichshaupt- u. Residenzstadt Wien. 1:30,000. Verfasst vom Stadtbauamte. 1901.

Plan der k. k. Reichshaupt- u. Residenzstadt Wien: Die Verteilungsanlagen der I. u. II. Kais. Franz Josef Hochquellenleitung. 1:50,000. [Stadtbauamt, Wien, 1910.]

[Region to the southwest of Vienna showing] Trasse der I. und II. Franz Josef-Hochquellenleitung. 1:200,000. k. u. k. Militärgeographisches Institut, [Wien].

Umgebung von Kastelruth, Seis, Salegg, Ratzes. 1:25,000. Verlag von Mich. Honeck, Seis.

Handkarte des Herzogtums Salzburg. Bearbeitet von Karl Adrian. 1:400,000. G. Freytag & Berndt, Wien, 1912. 24 Heller.

Touristenkarte der Sudeten. 1:100,000. Kommissionsverlag: Emil Wanke's Nachf., Josef Katzer, Mähr.-Schönberg. 50 Heller.

Schulhandkarte des Herzogtums Steiermark. Bearbeitet von Hans Trunk. 1:600,000. G. Freytag & Berndt, Wien. 30 Heller.

Austria-Hungary. Übersichtskarte der k. k. österreichischen Staatsbahnen und der im Staatsbetriebe befindlichen Privatbahnen nach dem Stande am 31. Dezember 1911. 1:1,300,000. With insets: Süd-Dalmatien; Nordwest-Böhmen, 1:750,000. [k. u. k. Militärgeographisches Institut, Wien, 1911.]

Central Europe. [Generalkarte von Mitteleuropa]. Sheets: 42°50° Lemberg, 43°50° Brody, 37° 44° Zvornik, 37° 43° Plevlje, 38° 43° Novipazar, 38°42° Prizren. 1:200,000. K. u. K. Militärgeographisches Institut, [Wien], 1912-1913.

Denmark. Stats–Telegraf– og Telefonkort. With inset: Kjöbenhavn. [Direction Générale des Postes, Ministère de l'Intérieur, Copenhague]. 1913.

Postkort over Danmark, Bilag til Post–Jernbane– og Telegrafhaandbogen. Scale about 1:700,000. With insets: Kjöbenhavn, Reykjavik, Hamburg, Rönne, Thorshavn. [Post Office Department, Copenhagen.]

Esbjerg. 1:8,300. J. Dalsgaard Olsens Forlag. Esbjerg. [1912].

Kort over Sønderjulland, med Navneliste. 1:320,000. Udvalget for Folkeoplysnings Fremme, 1912. 50 Øre.

Finland. Finlands Geologiska Undersökning (Suomenmaan Geologillinen Tutkimus). Sheets: Nos. 4, 1879; 7, 1882; 8, 1883; 9, 1884; 10, 1885;; 11, 1885; 12, Nystad, 1886; 13, Tavastehus, 1886; 14, Hangö, 1886; 16, Kumlinge, 1887; 17, Finström, 1888; 18, Tammela, 1889; 19, Hogland, 1888; 21, Mariehamn, 1890; 22, Walkeala, 1889; 23, Jurmo, 1891; 24, Mörskär, 1891; 25, Föglö, 1890; 26, Enskär, 1891; 27, Fredrikshamn, 1890; 28, Säkkijärvi, 1891; 29, Lavansaari, 1894; 30, Raivola, 1891; 32, Loimijoki, 1887; 33, Wiborg, 1892; 34, Muola, 1893; 35, St. Andreae, 1893; 36, Rautus, 1893; 37, Pyhäjärvi, 1893. 1:200,000. Finlands Geologiska Undersökning, Helsingfors.

France. Port de Boulogne-sur-Mer, Chambre de Commerce, No. 8. Plan du port et de la ville de Boulogne. [With French and English text]. 1:10,000. With inset: Carte du Détroit. Chambre de Commerce, Boulogne, 1912.

Pyrénées Orientales. [1:170,000]. André Lesot, Paris.

Germany. Wegekarte des Egge-Gebirges, Herausgegeben vom Egge-Gebirgs-Verein. 1:50,000. C. Brockmann, Bielefeld.

Karte von Südhannover, herausgegeben von H. Deppe. 1:150,000. Verlag von Vandenhoeck und Ruprecht, Göttingen. 1 Mk.

Karte vom Schwarzwald. 1:400,000. Otto Weber, Verlag, Heilbronn, a. N. 50 Pfg.

Prof. W. Liebenow's Wander–, Rad– und Automobilkarte des Spessart, umfassend Unterfranken und Aschaffenburg. 1:300,000. Verlag von J. Franks Buchhandlung, Würzburg. 1.30 Mk.

Prof. W. Liebenow's Rad– und Automobilkarte der Eifel und des Hunsrück. 1:300,000. Verlag von Jacob Lintz, Trier. 2.50 Mk.

Prof. Liebenow's Automobil–, Rad– und Verkehrs-Karte von Niederhessen u. Waldeck mit Teilen vom Harz und Thüringer Wald. 1:300,000. A. Freyschmidt's Buchhandlung, Kassel. [1913]. 1.50 Mk.

Brieger's Wegekarte der Grafschaft Glatz. 1:100,000. With inset: Wegekarte vom Glatzer Schneegebirge, vom Bielengebirge und Wölfelsgrund. 1:75,000. Verlag von Georg Brieger, Schweidnitz. 60 Pfg.

Wald-Karte von Oliva und dem Seebade Zoppot, für seine Besucher entworfen vom Verschönerungsverein zu Oliva. 1:25,000. Verlag von A. W. Kafemann, Danzig, 1912.

Neue Karte des Württ. Schwarzwaldvereins. Sheets: No. 1, Pforzheim, 1905; No. 2, Hohloh, 1902; No. 3, Wildbad-Calw, 1902; No. 4, Freudenstadt, 1901; No. 6, Alpirsbach-Schramberg, 1908; No. 7, Sulz-Oberndorf, 1911; No. 9, Rottweil-Spaichingen, 1913. 1:50,000. A. Bonz' Erben, Stuttgart. 2 Mk. each.

Neuester Plan von Graz. 1:14,400. Verlag von Paul Cieslar, Graz, 1895.

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